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SPRINGTIME WITH NATURE

The new season gives many signs of its coming

By EDMUND J. SAWYER

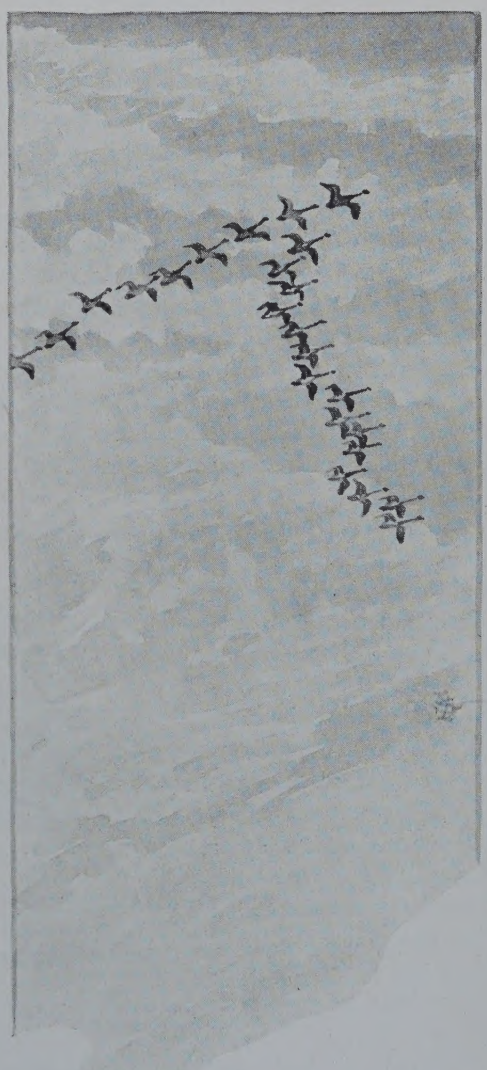
Illustrated by the Author

Lovers of the outdoors acclaim a wide variety of signs of spring. It may be the renewed cheery babble of the pasture creek; the fresh green along its bank; the piping of the little, unseen frogs that, in turn, respond to the general awakening; the first bluebird, a bit of the sky fallen, warbling unskylike, among us. There is the willow's new-found strings of pearls; the first flower to be sought.

My first recollection of spring is a clear-cut memory-picture of a solitary high-flying crow just returned to the northern border of New York state. There, on the still wintry shores of the St. Lawrence, was no other sign of spring, however slight, when the first crow appeared. The snow was still deep; streams and ponds hard-frozen. Yet, in a sense, cold, snow and ice vanished at sight of those first crows. Within a day or two after that first ebon pathfinder appeared we would be awakened of a morning by a somewhat nearer "caw-aw, caw-aw." Then, looking out the window, we would see one or two of the black harbingers bowing, attitudinizing, cawing from the top of one of the tallest trees of the village. It was time to think of robins, bluebirds, sweet maple sap, and frogs in the thawing ditches.

There would still be plenty of cold weather—likely as not a blizzard or two. Even when robins had returned in numbers I have seen small flocks of them huddled up among old grape-vines and dense apple branches. And I have seen barn swallows that had come in April so completely stormbound and benumbed with the cold that, for days, those that did not entirely succumb sat still and silent on the rafters, not once venturing from the barn's roof. The kingfisher, killdeer plover, sparrow hawk, cowbird, song sparrow and phoebe soon came to be recognized as "first birds"—heralds of that period of strife between winter and spring; it is the *coming* of spring, rather than her actual arrival.

In the southern states the coming of spring is a more general, less-marked phenomenon. The weather, the skies, the animal and plant life all seem more or less affected together and spring marches with a step more steady and assured. Her bird heralds are more consistent if more reserved. This, at least, has been my impression in West Virginia, North Carolina and lower Mississippi. In spite of the new birds, the weather itself, it must be confessed, forced itself upon

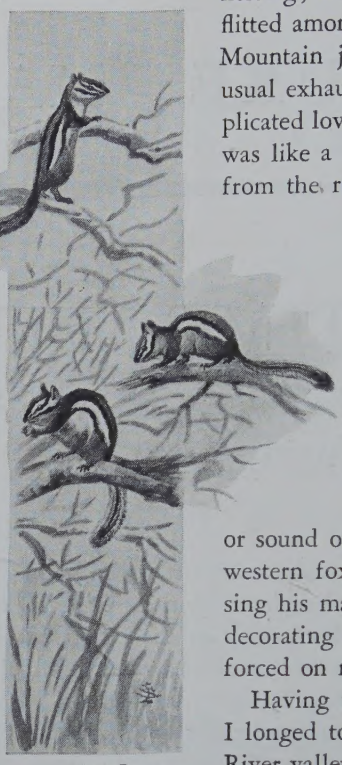


CANADA GEESE, PICTURESQUE IN LONG, WAVING LINE, THRILLING IN WILD CLANGOR

the consciousness; first for the sheer delight of its mildness, then for its unbearable heat.

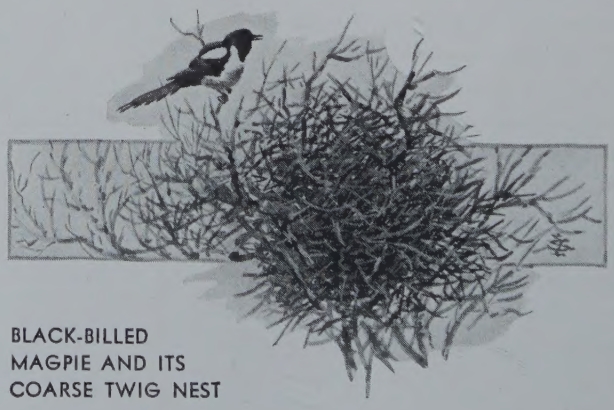
When the quest was for western mocking-birds, various western quail, bush-tits, cormorants and (on the way) road-runners and their associates, signs of spring were disappointingly obscure and rather too closely associated with temperature, dust and rain.

For three years consecutively, as Park Naturalist of Yellowstone National Park, it was my privilege to witness the coming of spring there. In many aspects the event reminded me strongly of the northeast. But, in the Yellowstone a "spring thaw" is a "chinook"; the first robin, bluebird and red-wing fill their well-known places—and just as charmingly—in spring's pageantry, yet many are different forms. Here, again, are the little sparrow hawk, the killdeer (as noisy as ever), the "hen" hawk tracing his customary graceful spirals high aloft; the song sparrow is here, even his pussy willow bough, as though he could sing on no other, is here with him. But right below our familiar brook brownie, where the stream, half choked by snow and ice, roars among jutting rocks, something bobs against the background of spray and foam. Instantly we are aware of being far from home. Now our avian friend has disappeared, but merely for a casual stroll on the bottom of the stream, immersed in a foot or two of swirling water! Imagine a bird the color and size of a catbird, with the build of a wren, the teetering habit of a water-thrush; a bird that blinks, mammal-like, perpetually; a true land-bird whose life, nevertheless, is one long cold bath. No, you can not imagine him; a bird "impossible, but true"—the water ousel.



LITTLE CHIPMUNKS ARE NOW NUMEROUS

In the Yellowstone there is the familiar strife of the elements before spring finally emerges triumphant—the uncertain skies and temperatures. However, it is perhaps worth passing mention that certain spots are favored with Spring's eternal presence. In these places the waters are always warm even in a winter setting of deepest snow, the grass is always green, the kingfisher and the Wilson's snipe are permanent residents; little oases of spring even in the vast desert of winter.



BLACK-BILLED MAGPIE AND ITS COARSE TWIG NEST

We have all heard such an expression or read the words, "suddenly spring burst forth". It remained for my first spring in southern Montana to teach me that something like that can really happen. After my summer and winter in a cabin in the woods came one day in the second week in March a chinook, then a succession of warm sunny days. On every side mountain chickadees were singing their "phoebe" song; Clark nutcrackers were nesting; the first mountain bluebird called and flitted among the sage near the woods. Rocky Mountain jays acquired, in addition to their usual exhaustless vocabulary, a new and complicated love language; one of these new notes was like a flicker's, another seemed borrowed from the robin. Cassin purple finches began regularly singing their "babbling brook" songs from the tall fir-tops. Pink-sided juncoes hopped and scuttled among the willow clumps along the creek, seeking bare spots in which to scratch among the dead leaves. Spring had come!

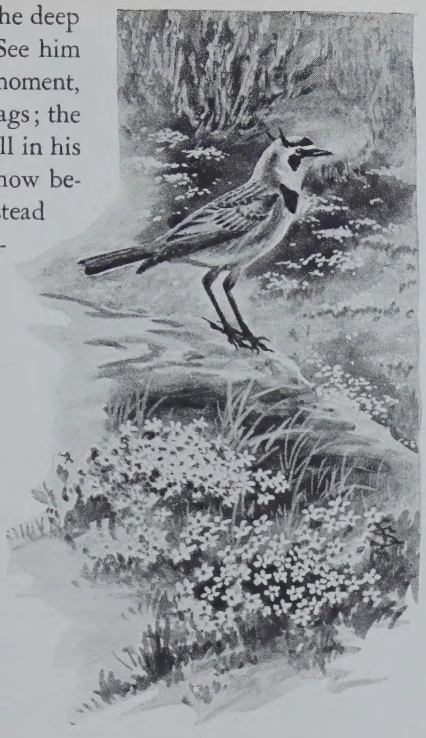
To be sure, she had not swooped down, owl-like, without hint or sound of her approach. When, however, a western fox sparrow alighted on an aspen top to sing his marvelous song, the large, soft tufts decorating the aspen twigs about him were forced on my attention.

Having thus greeted spring in the woods, I longed to witness her coming to Red Rock River valley just below. This leisurely hike of some ten miles proved so full of interest and, as I was to learn from continued experience, the animal and plant life so characteristic of the place and season, I wish to repeat the trip now—in your company.

The first leg of our hike takes us three miles down the sage-covered foot-hills to the stage road, which follows one edge of the valley-proper. That is a pine squirrel barking at us from a Douglas fir beside the woods trail. Several Clark nutcrackers pose grotesquely and call raucously from the dead top of an Englemann spruce. Now we emerge from the woods into the open sage. A large hawk soaring high above on broad wings reminds us strongly of our first hawk in the northeast—a well-remembered sign of spring. But, through the glass, he seems entirely black; a rough-leg, hence our first sign for the day of spring in the open still awaits us, for this bird has been with us all winter.

We have come two miles; "pure-er, pure-er"; the notes are unmistakably a bluebird's, but not quite the same as we are accustomed to. Ah, there is the singer himself; a bluebird, to be sure, but with no "earth tint on his breast".

He appears to be entirely blue—the deep blue of an unclouded June sky. See him lift his wings, flutter them a moment, then gently furl them like blue flags; the same pretty habit we know so well in his eastern namesake. But the bird now before us, on a sage-brush top instead of a fence, is the mountain bluebird. We are going down the last slope when, from the direction of the river, come the killdeer's cries with all the delightful effect of the voice of an old friend to strangers in a strange land. Soon another mountain bluebird greets us, this time on a perch which, to our eastern bias, seems quite orthodox — a weather-worn fence post.



WE NOTICE EVERYWHERE THE BEAUTIFUL LITTLE PHLOX, AND, AMONGST IT, A HORNED LARK

Now for the long but easy stretch of three and a half miles of wagon-road which will bring us to the river. Horned larks flush before us, to alight a little farther along in the road or scatter into the sagy fields that stretch away in all directions to the blue, snow-capped mountains. We are familiar with early horned larks in the sleigh-ruts and for a fleet moment old memories of sleigh-bells and "snow-birds" intrude unbidden. Then a familiar twittering comes from above. Only snow-buntings can put quite that indomitable spirit and merry cheer into a mere twitter. And there is the flock passing on wings that flash silvery white against the sky. The wanderlust has seized them; the tundras of their far northern home are calling with an insistence to which they must presently yield. More sage hens, a flock of fifteen, flush apparently from out the ground itself. Strange how these large dark birds can hide so successfully even where the sage is so scattering. It is a special gift of the gallinaceous tribe, this trick of self-abnegation; it is shared by all the grouse, partridges and quail.

We have come to the pole corrals and squat log buildings of a rancher friend on Red Rock River. In one of the corrals a bevy of blackbirds are silently feeding among the scattered hay and chaff. At our entrance they fly to a top rail and wipe their bills on the wood. Each bird shows a flash of brilliant red as he rises from the ground. Maybe we should call them thick-billed red-winged blackbirds, but, to all intents, appearances and manners they are our old friends of the cat-tail marshes, and what a treat to the eyes! And there are three cowbirds walking about the feet of the young stock near the other side of the corral.

We are at breakfast next morning when, glancing through the window, we observe a small gray animal who sits bolt upright, ever and anon twitching a short, furry, nervous tail—the first ground squirrel of the season; by this token the rancher, too, knows that spring has come. On our return trip we note the same birds as yesterday, with one addition—the prairie falcon, which is fairly common here from spring to autumn.

By March 22 we shall find sage hens in greater numbers, for they shift about a good deal between lower and higher levels. We shall hear robins singing, and see, on the ice under a creek bridge, a fine glossy mink that, having trout on his mind, will pay little heed to us.

April first dawns fine and warm, and again we find ourselves on the valley road. We are approaching the river when on quivering wings and calling "cur-lee, cur-lee" appears a large bird whose tremendously long sickle-bill is conspicuous even at a hundred yards—a long-billed curlew, of course.

On reaching the river we find ourselves gazing excited, amazed, thrilled! There before us are mallards, pintails, green-winged teal, buffle-heads, red-breasted mergansers; ducks are everywhere—in the water, on shore, some swimming, some dabbling, others asleep with necks folded back. Now a dozen mallards, with low, contented quacking, hurtle by low overhead, followed closely by a string of pintails that pass on wings that fan the still

THE CURLEW, ON QUIVERING WINGS, CALLING "CUR-LEE, CUR-LEE"

air with an audible whir-whir-whir in musical rhythm. As we follow along the shore, ducks flush from every bend in the stream which, with all the sinuousity of a particularly nervous snake, twists between its low cut-banks among grass and sage. See that pair of mallards, now, so unconcerned as we pass within easy gun-shot. How well they know spring shooting is no more! From a bend ahead a pair of Canada geese rise to flap away, honking. To-morrow we shall add a willet to our list, a fit companion for the curlew whose place in the local scheme of things he closely shares. A flock of red-breasted mergansers will delight us with their confidence and their striking color-pattern, jaunty crests gracefully re-curved.

WE FIND SAGE HENS IN NUMBERS, WELL CONCEALED IN THE GROWTH WHOSE NAME THEY TAKE

By April 21 we find willets abundant, spectacular in their peculiar rising, falling, hovering flight; picturesque as they stalk about or stand like giant sandpipers, their figures repeated in the shallow water. Far and wide sound their cries—wild, thrilling—the very voice of the great open prairie. One call suggests the whip-poor-will's, both for the note itself and for its insistence.

By April 23 waterfowl are more diverse than ever. In sight at one time, all within one hundred and fifty yards of us in and about a small swampy pond, are a pair of cinnamon teal, one or two pairs of pintails, a pair of shovelers, another of blue-winged teals, two coots, two willets, a killdeer, two California gulls, a pair of red-winged blackbirds, not to mention a few additional ducks paddling among the marsh grass in the background. Groups such as shoveler, cinnamon teal, pintail and coot are contained in the small circle our field glass covers. The drakes are all resplendent in full breeding plumage. The little cinnamon teal drakes glow with a bright ruddiness their name hardly suggests. All species are now busy with the elaborate tossing and bowing of the heads, especially on the part of the males, that appear to constitute in great part their courtship behavior.

Following Red Rock River about two miles we come to Long Creek, a tributary high and swift from its spring freshets. We follow up along its cut-banks, flushing mallards and teal here and there and occasionally tracing a little V-shaped wake that leads to a swimming muskrat. A short way ahead we see a commotion in the water. Arrived there, we find the Montana grayling are "running", the creek choked with their teeming numbers. In many places their long, dorsal fins project and wave from the water, while on the shallows others, stranded, flap their silvery sides helplessly on the half-submerged pebbles. All these fish approach a uniform size, the extremes in length apparently being between thirteen and sixteen inches.

Hitting off at a sharp angle from the creek, through sage and grass and sand, we notice everywhere in dense patches the beautiful little phlox. The prevailing color is white but many are more or less tinged with blue and every conceivable delicate shade of lilac and lavender to the deeper blue of hepaticas. There is also a scattering of short-stemmed dandelions and buttercups. By this time the groves of quaking aspen have come into prominence. Some groves are already green with small leaves; others are still in catkins, still others only budding.

On the 2nd of May the gray ruffed grouse is drumming in the woods. The yellow-bellied marmot (representing old friend woodchuck) is whistling in the woodland "parks" and about the higher slide-rock. Little chipmunks are now numerous.

It is later in the month, May 26, to be exact, and we have just emerged from the woods near the base of an escarpment along whose crest runs the state line of Montana-Idaho. A coyote springs up a few steps ahead of us, to slink away among the sage and boulders. Her (Cont'd on page 253)

THE COYOTE TURNS BEFORE SHE DISAPPEARS OVER THE RISE

SPRING AND HEPATICAS

By LOUISA R. GLEASON

FIRST, THEIR BELL-SHAPED HEADS HANG DOWN FROM PLIANT STEMS, THEN THEY TURN THEIR FACES FOR ALL THE WORLD TO SEE

WHEN the first warm days of early spring lure you outdoors with promises that winter has gone at last, cross your fingers and strike out for the nearest grove of mixed hardwoods. If you find the hepaticas shyly lifting their lavender heads (they may be white or even pink) you may uncross your fingers and know that the turn of the year has come, for the hepaticas, the first of the hardwood forest flowers, make no mistake in unfolding their cold-weather wrappings.

Both of the hepaticas, *acutiloba* and *triloba,* belong to the deciduous temperate region, which is blessed with four seasons. Every one of them has a definite and distinctive beauty; but it is the coming of the spring season that fills plant and beast and man with the tingle of new life.

During the winter, the hepatica leaves of last year have been green. Sometimes peeping from among old maple and oak leaves, sometimes through a blanket of snow, the three-lobed leaves have been conspicuous. Within the circle of their protecting stems, long before the snow has gone, a rounded, knob-like sprout has begun to push upward. It is encased in a two-lipped, purple sheath that fits snugly, one lip over-lapping the other. By the time that tantalizing something in the air stirs the latent caveman within you, the sprout has forced aside the sheath and released a cluster of tiny, fully-formed flower buds. Every bud is dressed in a woolly coat of soft, whitish hairs that over-spread its green bracts and red-purple stem. As though loath to face a frigid world, the buds are bent down and remain so until they are half-open blossoms, their bell-shaped heads hanging from pliant stems that stretch higher and higher above the mat of old leaves. It is then that their lustrous beauty wipes out any pricks of conscience, if you are playing hooky from other work.

The scientific botanist will astonish you by speaking of the bright-colored seeming petals as sepals. In this case the prosaic calyx of the flower world has become the glory of the plant.

With the passing of the days, the drooping flowers, one by one, begin to lift, their sepals spread open and, on erect stems, they turn their faces for all the world to see. It is their gesture of farewell. They have ushered in spring and now they withdraw from the van of the flower parade to go about the business of life. The sepals lose their radiance and begin to fall, leaving on each stem three wide open leaflets, at the center of which small, green seeds have formed in a several-pointed cluster.

There is no waste time for the hepaticas, nor do they display all their charms at once. During the days of blossoming splendor, the old leaves lost their distinction and the new leaves have been pushing upward. Every one is folded back against its stem and clothed, as were the flower buds, with a thick, fuzzy covering. While the seeds are occupying the center of the stage the cupped lobes of the new leaves are reaching up. Gradually they unroll. By the time the wearied flower-stems are bowing their heavy, seed-laden heads lower and lower toward the ground, a thick, green canopy is ready to shield them. The pat of a raindrop, the rustle from a breath of wind and the ripened seeds drop gently, within the family circle of leaves, to the bed of leafmold prepared by long-gone generations of other hepaticas.

Year by year the clump enlarges. If some of the seeds go adventuring, it is by way of a wind-blown leaf, or perhaps a tiny stream of water from a passing shower. They love their homes, and do not travel far. Once you find the hepaticas in your quest for spring, you will always know where to look for them.

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FOG AND THE SPIDER

By P. B. PEABODY

On a still, foggy, Wisconsin August morning at dawn, I eagerly rose and seized my camera. It was "high noon" for spider webs! I found them everywhere. On my brother's garden wire-fence I found a dainty, symmetrical web, quite rounded. This I tried to focus in the usual way; the web disappeared. Bafflement. And then a happy thought: *Focus into the sun!* This being done, the camera was swung a bit, to shift the lenses out of the sun-rays.

In the brushland, as if lighted by some Aladdin's lamp, one came upon a fascinating exhibition of webs of the common spider. There were infinite variances in designs and sizes. Between two clusters of red oak bushes, glowing a little in the tree-top-high morning sun, there was the daintiest, most elaborate spider web I had ever seen. It was a rare vision—some fairy lace, hung up to dry!

The wide meshes were drooping with their weight of beaded dew. As I gazed at them through the lenses, the meshes began to quiver, ever so gently. They were touched by a breeze my cheeks could not feel. I focused, then, by cross-lighting; shielding the lenses as best one might. The delicate beady-meshes again came into being, trembling, throbbing. Their quivering grew less and then was still. Two seconds; but that was quite enough.

Frog Hunting with a Microscope

A springtime pastime for those with inquiring minds

By JULIAN D. CORRINGTON

SPRING—time of trilliums, roast leg of lamb, and poets. Perhaps it was a poet, or just a wit, who remarked that at this season the bullrushes out and the cowslips about! Be that as it may, how about that annual trek after frogs, this year using your microscope to insure good hunting?

Frogs are too big to put under a microscope? Well, that depends on the age of the frog. After all, a frog egg is just as much a frog as is the tadpole or the fully mature amphibian. You don't agree? An egg is only an egg? Well, think it over. A frog egg is certainly not an ostrich egg, is it? Suppose we clear up the matter by observing under the lens various stages by which this egg develops into the familiar leaping greenback—an oft-repeated Nature study, but perhaps you have never before deepened and reinforced your vision with a microscope.

This story of animal embryology is one of the most amazing studies in the whole realm of biology. Famous literary genius and black savage; ponderous elephant and tiny mouse, all began their earthly careers as a single microscopic cell, product of the union of two parental cells—sperm and egg! What a lowly start for so grand a climax!

Frogs are no exception, and they too start life as a fertilized egg cell. But this cell, at first microscopic, becomes stored with an immense amount of food material—the yolk—and so passes out of the minute class into the readily visible. It is an extremely nice adjustment, this food storage. There is just enough to last through until the future tadpole develops to the point where it may feed and become self-sustaining.

The frog egg hunter, however, will have to rise early indeed on some bright morning during the last week in March or first two weeks of April, according to latitude and advancement of the season, and sally forth with a pail or outfit of mason jars. One had best, too, consult local game laws to see whether or not the taking of frog eggs is legal. They are protected in some states, but in most cases permission can be obtained from the warden's office when the object is explained.

Mating frogs will be found in ponds or roadside pools as soon as they have emerged from hibernation. Egg-laying takes place during the sunrise hours, the entire batch of eggs in the case of the common leopard frog forming a single large cluster, swelling rapidly by the absorption of water. Each egg, housed in its envelope of jelly, is spherical, the upper half or animal pole being heavily pigmented with black; the lower or vegetal pole being white.

GETTING CLOSE TO THEIR WORK

A group of enthusiastic young "microscope-hunters" have found a baby frog just come ashore

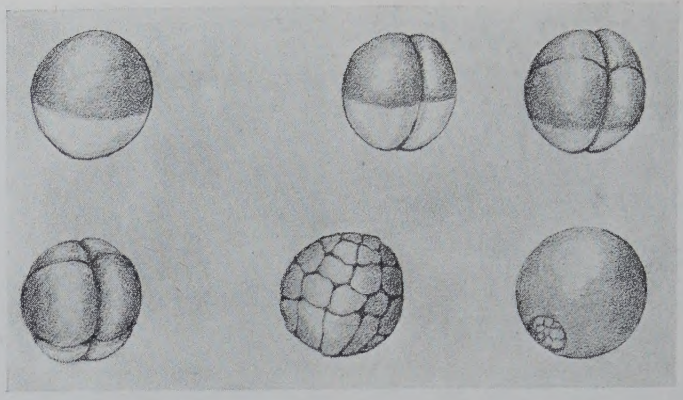
These colors exemplify another highly interesting adaptation, once a reason for them is sought. A dark hue is invisible from above, against the background of the pond bottom, while white is similarly concealing from below, against the bright sky; hence one function for this distribution of black and white is protective. A great many animals prey upon frogs at all stages of their existence, including the eggs, and protective coloration is needed throughout life. Again, the animal pole contains the living protoplasm of the egg cell, and this must be turned toward the sun, source of the heat energy necessary to propel the living machine along the highroad of development. Since we are familiar with the fact that black absorbs more heat than does any other hue, another function for the black pigment becomes apparent. Interesting creatures, frogs, even in the one-celled stage.

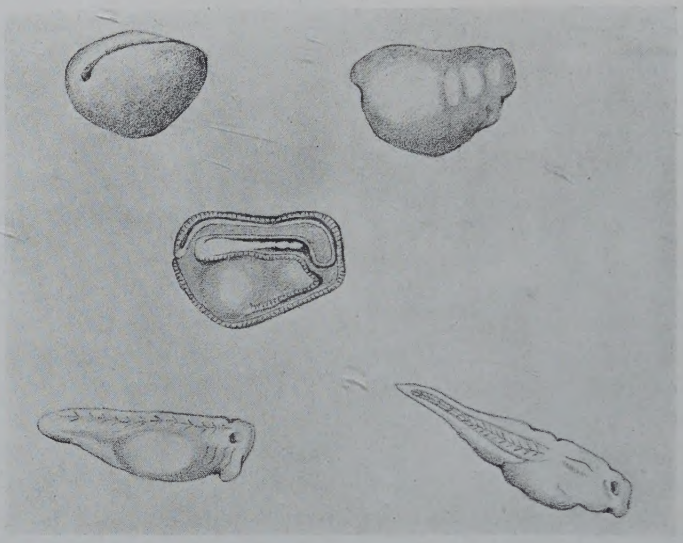
Temperature permitting, development proceeds at once, the single cell dividing into two, then each of these into two, and so on through eight, sixteen and higher stages of cell numbers, comprising a chapter of embryology termed *cleavage*. At the end of this phase the once large single cell has become a hollow ball of very minute cells, normal in size for frog cells.

The first cleavage plane passes through both poles and divides the egg into equal parts, destined to form the right and left halves of the future body. The second furrow is also vertical, but at right angles to the first one, while the third is horizontal and at right angles to both the first and second.

This system reveals the plan of cleavage, for each addi-

tional division is at right angles to the two preceding. But due to the concentration of living protoplasm at the animal pole and of the inert, non-living yolk at the opposite end, the cleavages become unequal as development progresses, the animal pole cells dividing more rapidly and completely than the others. The end result, a hollow ball of minute cells, shows a large number of small black ones at the animal pole, and fewer, bigger white cells at the vegetal pole.





ALL IN THE LIFE OF A FROG

Above, the individual egg, two, four, eight, and many celled forms and the yolk plug stage. Below, the neural groove stage, the neural tube stage (shown sectional in the center) and the external and internal gill stages. Drawings by Veronica E. Corrington.

And now to mount some of these stages so that they may be scanned at close range through the lower powers of the microscope, from 20X to 50X. The collector should carry with him into the field a pail or quart mason jar, a small, wide-mouthed bottle containing a 10 per cent solution of sodium hypochlorite which has previously been diluted with six volumes of water, and another similar bottle filled with a 10 per cent solution of formalin. The last-named is made by adding nine parts of water to one part of full strength commercial formalin. A dipping tube is also needed, with which to transfer eggs from one container to another, since they are too fragile to handle in any other manner. This is simply a six-inch length of glass tubing, capped at one end with an atomizer or medicine-dropper bulb. The open end is not constricted as is the case with the regulation medicine dropper, and so is amply wide to admit the eggs.

When a cluster of frog spawn has been found, cut a small mass containing some four to seven eggs away from the main group and place in the hypochlorite. After a few minutes shake the bottle to free the eggs from their jelly envelopes, then with the dipping tube transfer them to the formalin for preservation. Meanwhile the main cluster is stored in the pail, which should be filled with water from the pond where the collection was made. A single egg mass is more than sufficient for all the material needed.

Home again once more, the eggs fixed in formalin are inspected through a hand lens or under the compound microscope to determine their stage of advancement, and if the capture was made early enough, they will be found still in the one-celled or uncleaved condition. Samples from the jelly mass are similarly observed thereafter twice a day or oftener, and a few specimens removed and processed each time a new stage is detected. Keep the living egg cluster in a battery jar or aquarium, freely exposed to light and air.

Eggs are allowed to remain in the formalin for some twelve hours or overnight, then washed well for a similar period in running water. Next the eggs are transferred to a vial containing full strength commercial peroxide of hydrogen for one or more days until bleached to a light brown. The black pigment of the animal pole cells is so dense that bleaching is necessary in order to observe detail.

Again wash in running water for an hour, then dehydrate thoroughly in a graded series of alcohols. This means the slow removal of all water by alcohols of increasing strength; 50, 70, 80 to 85, then 95 per cent (full strength commercial) alcohol, one half hour in each. Then clear in aniline oil or carbol-xylol for fifteen minutes and in pure xylol for a like time. Clearing renders the eggs translucent and removes the alcohol.

Finally, the eggs are ready to be mounted in balsam on a clean microscope slide. The cover glass should be supported by tiny bits of broken glass, placed at the corners, as a frog egg makes a thick mount. It may be necessary to build up the balsam gradually by successive additions, allowing each layer to harden partially before the next is added. Be sure to keep the slide flat meanwhile and thoroughly protected from dust.

Taking up again the story of how a frog becomes a frog, after cleavage has been completed the animal pole cells begin to grow down over their lower though larger neighbors and eventually entirely encompass them save for a small circular area, the yolk plug, which remains a while and then in turn is withdrawn inside the growing frog. This process, *gastrulation,* converts a one-layered hollow ball (the *blastula*) into (Continued on page 256)

Oscar, Jaybird Extraordinary

By ALFRED H. HOLDEN

JUST what a blue-jay's normal mission in life is I cannot say, being an ailing office clerk instead of an ornithologist. In fact, in my boyhood days I have seen farmers lie in wait for jaybirds with double-barreled shotguns, and revile them as "pesky things"—and worse.

From the way I have known jaybirds to act I have always felt that the farmers might be justified, although maybe we have learned that jaybirds are here for some useful purpose, such as destroying insects. I do know, however, that all the jaybirds I ever saw were impudent, noisy, quarrelsome; chased other more desirable birds off the place and made nuisances of themselves generally. All of which makes Oscar an all the more remarkable jaybird.

OSCAR AND A FRIEND

The bird is resident at the Veterans Hospital at Outwood, Ky., but without benefit of any service-connected disability

Oscar lives at a Veterans Administration sanitarium at Outwood, Kentucky. His self-appointed and unusual mission in life is to amuse and help keep in a good humor a hundred or more ailing war veterans who are trying to regain their health, and professional entertainers will tell you that is sometimes a feat requiring real ability. Oscar is doing pretty well at it, however, and, thereby, doing more good than a dozen ordinary jaybirds could do by killing all the bugs in a dozen gardens.

While all of the men feel a proprietary interest in Oscar, he is really under the direct care and protection of William Bruce, a patient, who while out walking in the woods one day a little over a year ago saw a baby jaybird fluttering around, apparently lost. He brought it to the hospital, christened it Oscar, placed it in a big outdoor cage, and began feeding it.

The strangest thing noted about Oscar for months was that he wouldn't make a sound—never would go "jay, jay" as a jaybird should do.

After every meal at the mess hall Bruce would carry scraps to the cage and whistle in a certain way at Oscar—two notes, a high one and one a little lower. Then, one day, Oscar answered him right back, just like an echo! Astonished, Bruce tried it again. Again Oscar sent back identically the same notes.

From that time on Oscar has been whistling, and if anyone will answer him he will keep it up for hours. Every time he whistles he bobs down and up like a cork on the fishing line. Whistling is Oscar's chief accomplishment, and the one that is an unfailing source of entertainment.

At almost any time of day you can see a group of men sitting around Oscar's cage. After the wants of the inner jaybird have been satisfied, Oscar proceeds to do a few stunts. First, he will perch in the open door of his cage waiting to see who will start something. Someone will get his pipe going strong and blow a puff at Oscar. He will snap his bill at the smoke, always surprised at its intangibility, but ever trying to bite off a "chunk" of it.

When someone holds up a match Oscar becomes excited, hopping about and flapping his wings. The match given to him, Oscar seizes it, hops up on his perch, lays it flat on the perch, holding it in place with both feet while he uses his bill for an ax, and splits kindling. His aim is true although there always seems danger of his pecking off a toe.

This over, someone will hold up a penny. That always puts him in an uproar. When he can finally seize it in his bill he promptly buries it out of sight in the sand in the bottom of his cage. Bruce, when he cleans the cage, always sifts the sand and finds enough pennies to keep him in matches.

For a long time the cage could be left open unattended without danger of Oscar leaving. He seemed afraid to venture out. Lately, however, he seems to enjoy short flights into nearby small trees, and in addition to whistling he is beginning to make regular jaybird sounds. Not only does he like to get up in the trees, but he is getting so he refuses to come down when called. A penny or a match will coax him near, but he will eye you warily, and is too quick to allow anyone to lay hands on him. Usually, however, he will allow Bruce to lift him off the limb. One day he left the cage about noon and stayed out until almost dark. We thought he had definitely decided to leave. The whole place was worked up about him—patients, doctors, nurses. Finally a saucer of water coaxed him from a tree and Bruce seized him and "put him to bed."

Some of the boys think he has fallen in love with a lady jaybird, but Bruce believes that the tie of three meals a day is stronger than the tie of Nature. Oscar knows absolutely nothing about foraging for his own food, and loves a diet of Irish potatoes and hardboiled eggs.

Oscar's seductive whistle once nearly caused a battle.

One day Bruce was sitting by the cage when a lady, the wife of another patient, passed on her way to visit her husband in an outlying ward. As she passed Oscar's cage he gave a low whistle—the "wait-a-minute" whistle of a masher. The lady stopped and looked around, surprised. Bruce, amused, said nothing. She started on. Oscar whistled again. Again the lady looked around, this time with an icy stare. Bruce did not move. The lady went on, indignant, nose in the air, while Oscar whistled derisively until she entered the building where her husband happened to be.

In a few moments she returned. Her husband was with her, battle in his eye. Bruce must apologize quick—or else. Then Oscar whistled again, and saved a bad situation.

English Sparrow of the Molluscs

By P. A. MORRIS

LITTORINA littorea, now the common "periwinkle" of the north Atlantic shore, may well be called the English sparrow of the molluscs.

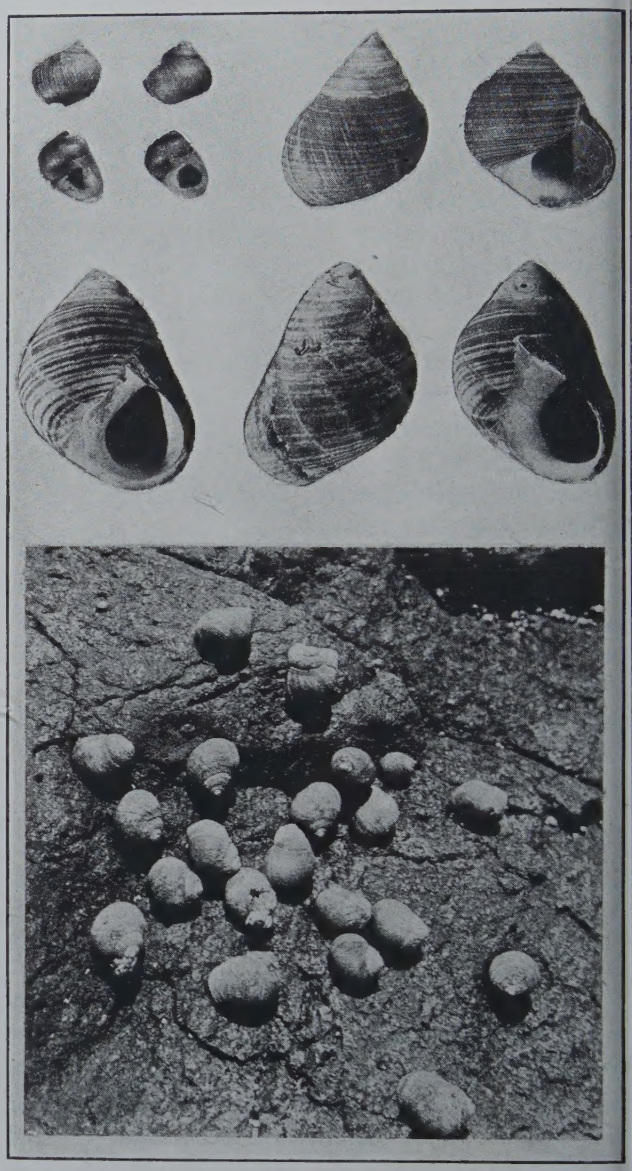
Previous to 1857 it was unknown to America, although common in European waters. Just how it gained a foothold in the western hemisphere is a question; presumably the eggs were transported as part of the cargo of some sailing vessel, possibly in seaweed used for packing, and dumped overboard on this side.

At any rate, the first specimen recorded in this country was found at Halifax, Nova Scotia, in 1857. This was reported and described by a Mr. John Willis. At this time the common snail along our coast was a smaller species known as *Littorina palliata.* In 1868 the larger introduced snails were found at Saco, Maine, and a few years later they had spread down to Casco Bay. They were reported in Provincetown as rare in 1873, common in 1875 and abundant in 1879. Their southward course continued, and in 1880 they were common on the coast of Rhode Island, and that same year the first specimen was found at New Haven, Connecticut.

At the present time they range south to the New Jersey beaches, where the warmer water apparently serves as a check to their further spread. Meanwhile, *Littorina palliata* has been all but crowded out, and now forms but an insignificant part of our molluscan fauna.

Some writers have declared that the larger one is not an introduced species, but has been here all the time, simply overlooked until 1857. However, there are several reasons for believing that it is not native to this country. In the first place it is unquestionably identical with the *Littorina littorea* of Europe. It is hardly likely that it could have been overlooked by all of the old time conchologists, yet in the works of Reed, Russells, Gould, Mighels, and Tufts (all published prior to 1860) no mention is made of it, although the occurrence of *Littorina palliata* is frequently noted. As a further argument, the ancient Indian shell heaps found along the coast of Maine and New Brunswick contain many shells of *L. palliata,* but *L. littorina* has never been found in one.

In Europe tons of these dingy little snails are roasted each year and sold from push-carts in the city streets. In America there seems to be an aversion to eating them, but just why we should consider clams and oysters a delicacy and act horrified at the thought of eating a snail is hard to figure out. Anyone who, through necessity or curiosity, has tasted them pronounces them excellent, and the writer can testify that they are equal in texture and flavor to the best of clams.



LITTORINA LITTOREA AND LITTORINA PALLIATA

Upper left: four *Littorina palliata,* smaller native cousins of *Littorina littorea.* Below: the common larger periwinkle in native habitat —resting on the rocks at low tide

On the open sea-coast *Littorina littorea* is a robust, thick-shelled snail, over an inch long. In protected bodies of water, such as Long Island Sound, they seldom attain a length of more than three-fourths of an inch, and are correspondingly thinner walled.

A WINTER WREN GUEST

By LOUIS C. LINN

Illustrated by the Author

ONE winter I had, for a companion in solitude, a little winter wren. I had seen him scurrying about, and heard his merry chatterings for some time before he fully dawned upon me as a separate little entity, apart from the rest of the feathered clan, that I daily met in the woods.

Several times when I had lit my lamp a little before dark, I had been puzzled by hearing something strike and scramble over the screen that covered the unshaded window. Then I discovered some white linings on the screen and was really amazed, for apparently that bright, shy little bird was actually sleeping on the ledge above my window. My lamp, bracketed to the window frame, burned sometimes all night, while I alternated beating on the typewriter with mending shoes and playing a victrola; so for a little bird to choose such a place to roost seemed almost incredible to me. There was however one advantage, if the wren could sleep through my racket, the noise and light were good protection.

I was fairly sure it was the wren, but I wanted to make certain; so the next evening just before dark I seated myself on the table by the window, with my face close against the glass. Twilight was rapidly falling, gathering into dark shadows in the woods but still lingering in the cabin clearing and out on the river, which shone like a silver band. Soon there was a slight flash of movement, and the next moment a little gray ball of feathers shot up and landed on the upper window ledge, close to my head. It *was* the wren.

I sat back on the table and glowed with pleasure. It sounds ridiculous, but in my solitude, surrounded by the aloofness of all Nature, this volunteered companionship, even in so small a quantity, was precious. After that I always waited for the wren to scramble to his roost before lighting my lamp, since the light blinded him on the way to his perch. It became a part of the day's routine, this watching at the twilight window for the home-coming of my little ball of feathers.

What a bright-eyed, cherky little fellow he was; about one size smaller than my thumb, dressed in a little brown-gray suit, that, viewed closely, showed a miracle of delicate shadings and dapplings. His tail, his most distinctive feature, struck one as something that had been almost overlooked in his making, but at the last moment had been stuck straight into his back, instead of being joined to the end of his spine as birds' tails normally are. From morning till night he seemed never still a second; even in repose his little body was continuously flinching.

Often, pausing in my work late at night, when the north wind struck a deeper organ note from the forest-clad bluffs above, I thought of that tiny bird sleeping there within my arm's reach, fanned by each icy blast that roared above us in the woods. How could he keep from freezing, I wondered. His little legs were no larger than the lead in my pencil; his toes much smaller. His feathers probably covered them now and his little heart was going beat-beat-beat to keep him warm. What dreams were moving in that little sleeping head, I wondered, as the stars circled the icy sky.

Through the day, when we met at our various occupations, I always made a point of stopping for a little chat; and what a lot of interesting things he had to tell me, if only I could have understood his language—memories, perhaps, of the long trail that he follows, fall and spring, between his summer home in far-off Maine or Quebec, and his winter retreat here on the Potomac.

I had, early in our association, each morning thrown out some crumbs of bread and meat for my little guest's breakfast. As time went on any oversight in this formality was brought sharply to my attention by an amount of scolding and fussing out of all proportion to its tiny source. Also, on mornings when, from a too prolonged night's work, I overslept, didn't I catch it! The first intelligible sound to greet my waking would be that tiny bird's jeremiad at the door. As soon as the crumbs were forthcoming, the perfect quiet of a forest solitude would

settle on the cabin. How I did enjoy that little rascal's scoldings, how too-awfully quiet would have been the mornings that did not hear it.

This little wren had a passion for any kind of little insects that live anywhere on trees dead or alive, and especially for those little white grubs that live just under the bark of dead trees. In my daily work of wood getting, I was sure to have the wren in close escort; for in handling the wood the bark would be dislodged and the quarry disclosed. In the excitement of the chase, he would dash in between my legs and arms, under my very hands, to secure the game. Often I was forced to stop cutting, for fear I would accidentally chop him when he waxed too enthusiastic in his hunting.

In time he grew so used to me, that although he would not let me catch him, he thought nothing of alighting on me, when I remained still. Sometimes he would perch upon my knee, while he searched out a particular annoying louse that had gotten under his vest. At such times I could easily have caught him, for his head and eyes would be busily buried in his feathers. He would presently jerk his head free, and regard me narrowly with his little bright black eyes, as if he had half guessed the thought in my mind, but quickly reassured he would go back to his preening. And well he might, for in spite of my longing to have him in my hands, I would not take advantage of his confidence.

One Sunday morning in March, I awoke to a steady drumming of rain on the roof above my head and the usual scoldings for sleeping late, from my little pensioner, and called out: "Oh shut up, bad enough to have a rainy day, without you fussing about." At the sound of my voice, that mite simply outdid himself in chatterings.

After breakfast, he went off to "do" the brook, a favorite hunting ground of his, but the continuous downpour must have spoiled the hunting for I presently discovered him sitting disconsolate on a log under the porch.

By noon it had grown perceptibly colder and spots of white were beginning to mix with the gray lines of falling rain; also the wind was beginning to blow. Soon after that it was all snow, falling thick in a long wind-driven slant, that quickly banked the window screen, reducing the light in the cabin to a twilight dimness. We were certainly in for something. I walked restlessly up and down the room, going continuously to stare out of the small side window, that remained clear. The far shore of the river had disappeared and the island was a wan ghost, half lost in a curtain of gray. Near at hand the snow whirled in clouds between the trees, pasting itself thickly on their northern sides.

Each time I went to replenish my wood box, I would find little "noisy" busily scampering over the logs piled in the wood shed; so, knowing him to be under cover and myself snug and warm in the snow-banked cabin, I sat back and enjoyed that storm, while the day marched grandly forward. The wind boomed and roared through the forest, with an ever-increasing volume of sound, and, by and by, a new note began to be noticed; an occasional prolonged detonation, that told of the fall of some forest giant, overborne by the weight of snow and wind. Large chunks of snow, that had collected and frozen on the tree limbs, were being torn off by the wind and hammered the roof incessantly; often the limbs came along, their impact deadened by the fallen snow. In spite of the warm snugness within the cabin, a sense of the insecurity of all things tingled one's nerves, as the gray light waned out and the storm roared on.

Hours after dark, anxious over my little friend, I got into boots, storm coat and hat, and, armed with a flashlight, braved the storm, to pay a visit to the front of the cabin. To avoid frightening the wren, I turned the light first on the illuminated snow of the window, then raised it until its rays invaded the space beneath the projecting cowl. There, sure enough, was the little fellow, a little ball of wind-whipped feathers, sticking to the window ledge.

Whatever uneasiness I felt for the wren's safety through that night of storm and snow was set at rest on the following morning when, waking late to the subdued light of snow-banked windows, the first and only sound I heard, breaking the death-like quiet, was that little bird's chatterings for his breakfast.

It seemed only a few days later that the "spring-peepers" were whistling in every marsh, and all manner of little flowers were pushing up through the fallen leaves. It was again definitely spring. The first act of my waking day now was to go out to the open end of the woodshed, and there in a warm, sunny nook to take a smoke while I rubbed my eyes open and enjoyed, with renewed senses, my environment of rocky crags and forest clad bluffs. Going out one morning, sleepy-headed as I was, I noticed a new note in the wren's scolding, and wondered if a hawk was bothering him. Halfway through the woodshed I was brought to a stop by the stridency of his fussing. He was just before me at the open end of the shed, hopping excitedly from one point to another and never ceasing from that violent note in his chatterings. I rubbed my eyes and looked more carefully about and finally noticed on the ground a few steps before me a copperhead snake, stretched directly across my path.

Well, all birds fuss at snakes, but just the same that wren had saved me from a very painful and dangerous bite and if it wasn't done intentionally, there was at least little difference in the result.

All this happened three years ago, and each winter since then the wren has journeyed back from his distant summer home to occupy his sleeping porch bedroom. Each winter our companionable episodes have been reenacted in much the same detail. When spring next calls him away he will carry with him my prayer for a pleasant summer, and a safe return.

My only regret is that I cannot tell him how much his companionship has meant to me.

HOW WELL DO YOU KNOW YOUR HERBS?

Here on the chopping tray is gathered a distinguished company of important and useful herbs, including parsley, borage, garlic, green onions and chives

HOW ABOUT SOME HERBS?

By ADOLPH KRUHM

TWO BROAD divisions of herbs are now recognized by home gardeners. Those chiefly grown for their flowers are widely known as old-fashioned hardy perennials. We generally think of others as culinary, medicinal or pot herbs.

The vast majority of herbs we now grow were originally natives of Africa and Asia. They came to us by way of the shores of the Mediterranean Sea. Reference is made to some of them in the Old Testament. Greek as well as Roman writers were familiar with many and recorded their chief characteristics. Migrations of mankind, advancing north and west, brought along many of these useful plants, until we now meet many of them throughout the civilized world.

Roman invasions introduced herbs to France and, subsequently, to England, two countries still famous for their knowledge of herbs and how to use them. Incidentally, it remained for the so-called "dark" Middle Ages to rediscover many of their medicinal properties long known to the ancients and almost lost during intervening centuries.

Many seed and nursery catalogs offer scores of varieties under the heading "Herbs for the Kitchen Garden". But more and more of our gardens are conducted for both beauty *and* utility. The combination of these two highly desirable characteristics is largely responsible for the reviving interest in culinary herbs.

Usefulness and beauty, being of relative value, are seldom found in equal degree in one and the same plant. The flowers of some herbs constitute their greatest attraction, but their foliage is their truly useful part. Other herbs we grow partly for their attractive foliage, but their seeds are their worthwhile crop. Few bring us all desirable qualities. With some herbs we are even willing to forget all about beauty, because we positively need them for flavoring. Consider the onion tribe!

For untold ages onions have served mankind. When and how their usefulness as a food and seasoning was first discovered is lost in the dim past. But ancient Greek naturalists inform us that, 6000 years ago, bread and onions formed a steady diet for the laborers that built the Pyramids of Egypt. No doubt the inhabitants of Crete were familiar with and used onions even thousands of years before that.

Many salads would lack allure without onion flavor. Even the most powerful member of the tribe, the much

HERBS PLANTED TO ROUND OUT THE GARDEN PLAN

A planting of the perennial border that includes such decorative and useful herbs as artemisia, lovage, sage, rue, thyme and borage. How many can you recognize?

discredited garlic, is considered absolutely essential by some connoisseurs to bring out certain salad tastes.

Who would think of *Schmierkäse* without chives—the mildest member of the onion family? Chives may also form an attractive border around your flower garden. Their slender foliage during late June and part of July is surmounted by globular umbels of lavender flowers. A fifteen-foot border of chives will provide mild onion seasoning from earliest spring until frost stops further growth. But next March new shoots will again push through the soil from the same old roots, to do duty another year.

Second only to these various onions we value that greatest of all flavoring mediums, parsley. With us no other herb is put to a greater variety of practical uses. Expressions of appreciation of its many valuable qualities go back to the days when men first took pains to write about plants. The ancient Greeks freely used parsley for both sentimental reasons and for soups and salads. Wreaths composed of parsley leaves were placed on the tombs of their departed heroes. At their famous Isthmian Games the victors were crowned with wreaths of parsley and celery leaves. Many ancients looked upon it as a symbol of eternal life, and in some countries parsley sprigs were given to babies on their first birthday to congratulate them for having lived safely through that most dangerous year.

The extra curly or double type is preferable for garnishing, while the old-fashioned single type is the strongest flavored, whether used with vegetable, meat or fish. Besides, it supplements the food with certain medicinal elements, chiefly iron and mineral salts. Parsley is a biennial that will "go to seed" the second year after it is sown. Most home gardeners sow it every spring, and its decorative appearance as a border makes it a welcome guest in flower gardens throughout the land.

Garden thyme, *Thymus vulgaris,* is a close competitor to parsley as a great herb for seasoning. It is freely used in stews; and clam chowder without thyme somehow does not taste right. The individual plants make compact little bushes of symmetrical growth, for which reason it is popular as an edging around flower beds. Thyme stands hard usage and the more you cut it the denser it will grow. Like its cousin, sweet marjoram, it is used to flavor sausage and other meats.

Sage, *Salvia officinalis,* may be called America's favorite seasoning. Its dried leaves make up an important ingredient for the "dressing" of all fowl, lamb and veal. A well-grown sage plant is an object of exceptional beauty, ornamental in any garden. It grows about two feet tall and its leathery gray-green leaves lend the plant a substantial, dignified appearance.

Rosemary, *Rosmarinus officinalis,* deserves greater appreciation especially by those who like to inhale fine scents. This fragrant evergreen herb comes to us from the mountainous regions of the Mediterranean where it

is frequently grown in pots. It is a great boon to bee-keepers, the honey extracted from its flowers having a particular aromatic flavor. In some parts of Europe the oil yielded by the foliage is rubbed into the scalp as a hair tonic.

Rue, *Ruta graveolens,* was early introduced to me because, as a boy, my friend Bill Toole used to have boils. To cure these his mother brewed a tea from the leaves of rue. In later years Bill told me that the cure was worse than the boils. What a great time people must have had in the good old days when concoctions of (mostly bitter) herbs constituted the principal remedies for all ills! However, rue is exceedingly graceful of habit and was known therefore as the "herb o' grace" in olden times. The ancients knew it, too, and esteemed it for both its curative and disinfecting qualities. Pliny mentions it as a remedy for more than eighty different maladies. Judges, while holding court, kept it on their benches to ward off fleas, noxious insects and contagious diseases apt to invade the court with the prisoners.

Rue plants grow about eighteen inches tall. The woody stems are abundantly clothed with gracefully divided, bluish-green, wavy-edged leaves. The slightest touch will bring out its pronounced odor which does not find favor with those having exceptionally sensitive nostrils.

COMBINING BEAUTY AND UTILITY

Borage has qualities that add decoratively to the garden and contribute, also, in a useful way

Savory, *Satureja hortensis,* somewhat resembles thyme but grows taller and has coarser leaves. It is also spicier than thyme and for this reason is known as the "pepper herb" in many parts of Europe. No German housewife would think of boiling beans without a few sprigs of savory. As a matter of fact, it is one of the most freely used of all kitchen herbs in that country.

By itself, or together with marjoram, it provides a most savory dressing equally palatable with fish, fowl or meat. As an addition to soups and stews it is unequalled, while a judicious use lends additional qualities to otherwise insipid salads. As to its ornamental qualities—sprigs of it added to bouquets of rather stiff flowers like marigolds and zinnias will cause them to look more graceful.

Lovage, *Levisticum officinale,* has an ornamental foliage that improves soups, salads, and stews alike. The stems are readily blanched like those of celery and are much sweeter. Both stalks and roots are equally useful in the making of candied garnishing for cakes. As such, lovage is offered in many parts of Europe under the name angelica.

Borage, *Borago officinalis,* is the one annual herb we cherish highly in our own garden. Its grayish-green foliage is decorative at all times. The young leaves, finely chopped, lend a decided cucumber flavor to any salad. Its beautiful sky-blue flowers (tinged pink late in the season) afford a happy hunting ground for honey bees. To entertain children just put some borage leaves on top of a hot stove. The salpeter they contain will cause them promptly to explode with a puff. While the first black frost will kill the plants, this sturdy garden inhabitant proves faithful in coming back of its own accord next spring from seeds scattered by the old plants the previous fall.

Mint, *Mentha piperita,* is freely grown in all parts of this country as well as in Europe. Roast lamb and mint sauce are a famous gustatory pair, not to mention its association with juleps. Thus we find a bed of mint useful, and the foliage and the lavender flowers cause it to be decorative as well.

Tarragon, *Artemisia dracunculus,* has plants growing two to three feet tall, with attractive blue-green foliage and white flowers crowning each stalk. Because of its piquant aromatic flavor the leaves play quite a part in the making of vinegar. But it is undeniably one of the most ornamental hardy herbs. As a background for dwarfer kinds having lighter green foliage it is unexcelled.

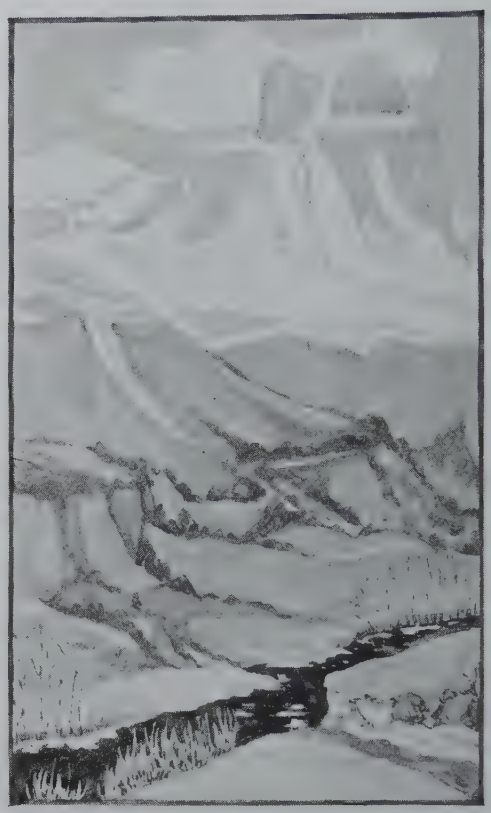
Wormwood, *Artemisia absinthium,* has silvery-green foliage of outstanding beauty, especially in contrast with darker-leaved plants. Used in the making of vermouth and absinthe, it is also esteemed as a reliable remedy for stomach and liver disorders. The name has come to mean bitter.

In planning and planting special herb gardens a study of the character of growth of the various plants is desirable, if not essential. The height and the color of their foliage determine their fitness for the specific positions they are to occupy. Charming pictures may be created within the hardy border by watching this detail.

Restoration of the old custom of devoting a corner to these "yarbs" will pay big dividends.

MARCH CHINOOK *By* JOHN LINDSEY BLACKFORD

Illustration by Margaret Finnan



IN DEFIANCE of the airy blusterings and windy threats of March, there come within his thirty-one changeful days the first sighs of an awakening, the first whispers of a promise. Most gladsome, most winning bearer of spring tidings is the March chinook. So completely are we captivated, so entirely convinced are we that winter has fled, that March is obliged to call back his wildest gales and dourest skies, ere he may with dignity hand on the baton in the relay of the year to fair April.

While by definition the chinook of the Rockies is a warm, dry, foehnlike wind blowing down the eastern slope of the mountains, melting the snow with remarkable rapidity, the name is by extension applied to those soft, warm mountain and valley breezes that wander among the westerly ranges.

When we step forth into the morning while that magic wind is blowing, what a nostalgia for spring tugs at our hearts! A sky of cobalt with racing white clouds sailing over, the tossing of the pines and firs, and a brighter sun shining with renewed warmth and energy—yes, doubt it not, after winter's desperate siege it is a taste of dreamland, made more precious, perhaps, by its brevity.

How we love to walk upon the newly uncovered earth and watch with happy eyes the snowpatches begin their retreat to the deeper woods. We linger long among the wine-red osiers, attentive to the gurgle of an exulting streamlet, feast upon the dark beauty of hillside vistas, and count the bare slopes upon the foothills.

Climbing the southerly side of a hill where the ground seems strangely firm for having so lately been mantled with white, I find a lingering snowbank, spread my mackinaw and drop upon it. Cooled from the tiring climb, yet made comfortable on that damp couch by the brilliant sunshine, one may dream away a fleeting hour. Very soothing seems the piny flavor of the atmosphere touched with the faint incense-like fragrance of the mountain laurel. Lulled by the low murmuring of the chinook wind, the nodding of the conifers, and the gentle swaying of many needled branches one sinks into forgetfulness. It is a day for reverie.

My eyes close, and as they open again I see a majestically soaring hawk leave off circling, and slant away upon a strong air current. How a wind discloses the beauty of wings! From close by comes the high piping of a pair of nuthatches, and eerily, faintly but limpid clear, from down the hill the elfin "sweet spring" of the chickadees.

When March winds blow what sublime concerts are played upon that mighty woodwind the forest. Tempestuous and stormy are its many voices, or hollow-toned and low, rivaling the sea as Nature's greatest symphony. At times when a gale is playing upon it the sound of its myriad strings rises to a thunderous bellow as of mountainous seas breaking upon a buttressed shore; or dropping to a tender harmony the whispering chorus of the pines croons an aeolean lullaby. We hear in its breezy murmur many spirit voices of the wood.

Again with a great onrush of air the sound produced is like that of a giant broom sweeping across the treetops, as if winter was drafting recruits.

But it is the March Chinook, alluring and seductive, that draws us from our firesides into the arms of the new year. Its breath is like the touch of a gentle hand laid warmly upon one's own, or as the soft pressure of one cheek brushing caressingly against another.

It is the first sigh of awakening spring. It seems to tell us that at last we may rest and dream. No other, languid zephyr or puissant storm wind, is like it. Coming with the first beaming glances of the sun and slipping away like a wraith, the chinook brings to our hearts a long enduring peace and contentment. Miraculously the whiteness of the landscape vanishes. Spring, we know now, is but hiding from us momentarily.

Rising on elbow I scoop away the littered surface of the granulated snow, searching for a clean handful or two. It may be the last taste of it until another winter; and likewise too, I throw a few more snowballs before turning down the hill.

Again and again the sense of deliverance from the dragging of snowshoes, or the slipping of snow-clogged feet on hidden ice, comes to our consciousness. We have to guard against tipping forward when a stretch of smooth footway is encountered. Not at once do our legs accustom themselves to the new freedom. But all nature is joyously helpful.

We tread the path with lighter feet. Old troubles seem not so weighty; old problems no longer evade solutions. The new season and the new adventure lie before us. So is it ever along the trail of the chinook wind.

The Nature Picture of the Month

A sophisticated Black Bear poses obligingly for the camera of Ralph Hopewell Anderson. Taken in Yosemite National Park

The Australian Lyre Bird is here photographed in its courting display by F. Lewis of Victoria, Australia. The tail, with its sixteen feathers spread out fanwise, is thrown forward over the head. In this position the bird dances and sings, imitating a great many of the birds and other sounds of the forest, even to the sound of chopping wood and a dog barking. It is the master mimic of the bird world. In the picture above the bird is facing the camera, its outspread tail hiding the body. Below, it is shown in side view, revealing some of the bird's body obscured in the other picture.

The tail of the Lyre Bird is usually represented as suggesting in form the musical instrument after which the bird is named. Thus most paintings and drawings, mounted specimens and even the picture on Australian stamps show the tail slightly spread, as it appears when the bird is at rest, and before it has attained the extreme frenzy of courtship display that was caught by Mr. Lewis.

These are noctilucent clouds shining fifty miles above the earth on a summer night. This picture was taken by Professor Carl Störmer in Norway at about eleven in the evening. The nature of these luminous night clouds, the altitude of which is accurately known from photographic measurements, has been the great mystery of cloudland. They are so high that they shine by reflected sunlight long after the stars come out. Perhaps they are composed of fine dust—volcanic or cosmical—but nobody knows positively. The latest theory proposed is that they consist of ice particles condensed from moisture spouted into the upper air by volcanic explosions.

THE CLOUD MUSEUM

Though you cannot pursue the hobby of collecting clouds, you can collect pictures of them. There is, of course, a certain satisfaction in getting the pictures with your own camera, but if you depend upon that method you will probably miss many of the interesting rare forms. If you wish to stock a real cloud museum you must ransack the collections of photographs taken by a host of photographers in many parts of the world.

You would doubtless have occasional opportunities to take banner clouds, which stream out like great white flags from mountain peaks. Seldom, however, would you come across so remarkable a specimen as the one that floats from the Rock of Gibraltar when the east wind—the "levanter"—is blowing. Crest clouds, stretching along the summit of a mountain ridge, are not very rare, but the ardent collector would not be content if his album lacked a good view of the example called the Table Cloth that is often spread over the flat top of Table Mountain, in South Africa. The "foehn wall," of the Alps, is another famous cloud of this type.

Cloudland is not fully represented in the sets of pictures showing the standard forms of the International Cloud Classification—cirrus, cumulus, stratus, and so on—found in the books on meteorology and in the encyclopaedias. The photographs on the adjacent pages give you just a hint of the great diversity of clouds.

An anvil in the sky. The cloud of the thunderstorm is known as cumulonibus and often assumes the shape of a huge anvil, on which one may fancy that Jove forges his favorite weapons. No two of the heavenly anvils are exactly alike. The one here shown is unusually striking. U. S. Weather Bureau Photograph.

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The levanter cloud at Gibraltar is caused by an east wind over this rocky eminence. It is a damp wind that brings muggy weather, and some of its moisture is condensed to form the long streaming banner of the "levanter cloud", which often stretches more than a mile over the Bay. Photograph from Meteorological Office, London.

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The "boa cloud" creeping along a New England hillside. Dr. W. J. Humphreys of the Weather Bureau has given a name to a rather uncommon formation; a narrow strip of cumulus coiling around the flank of a mountain. Photograph by I. F. Hand.

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Look out for tornadoes when there appears in the sky the "pocky cloud" ("pocky" is Scottish for "baggy") that is known to science as mammatocumulus. It often precedes the formation of the tornado funnel, but such clouds are also associated with thunderstorms. Photograph by Omar J. Murphy.

Spokes of cloud that seem to radiate from a single point on the horizon are in reality virtually parallel, the apparent radiation being an effect of perspective. The most familiar spoke-like clouds—called "polar bands" or "Noah's ark"—belong to the lofty, feathery cirrostratus type. This strange specimen, photographed by the U. S. Navy at Lakehurst, N. J., is a lower cloud and difficult to classify.

Such clouds as those pictured below are sometimes called "whalebacks." They are classified by science as "lenticular", but, to borrow a phrase from Shakespeare, are "very like a whale". Fine examples are seen in the polar regions, where explorers have nicknamed them "whalebacks". This picture was taken on the coast of Greenland by P. C. Oscanyan, Jr.

The "foehn wall" heralds the coming of the foehn wind in the Alps. Following the appearance of this crest cloud over the mountains a hot, intensely dry, boisterous wind sweeps down into the valley. The foehn is nicknamed the "snow-eater", because snow disappears as if by magic before its parching breath. The chinook wind of our western tablelands is the American counterpart.

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The far-famed "tablecloth" spreading over Table Mountain at Cape Town, South Africa. This cloud forms suddenly. Persons who climb the mountain are frequently caught in it, and some, losing their way, have fallen to their death over the cliffs. Photograph from South African Railways.

On this and the two succeeding pages are reproduced pictures submitted in the Rotogravure Contest for outstanding Nature pictures. Nature photographers are now invited to submit pictures for the next series of our Rotogravure Sections covering the issue of Nature Magazine from June to September. Pictures must be submitted before March 1, and the special award of twenty-five dollars will be made each month; other outstanding pictures will be given an honorable mention award of three dollars each.

The splendid picture of the brown thrasher at its nest was recorded on the film of a Graflex camera used by Lorene Squire of Harper, Kansas. Carl Naether of Van Nuys, California, also used a Graflex to get his interesting shot of "hens and chickens".

MOTHER LARK SPARROW AND HER NEST
Photographed by Miss Lorene Squire, Harper, Kansas

Spiders are one of the hobbies of Lee Passmore of San Diego, California, and readers will recall his tarantula pictures in February and March. Here Mr. Passmore has photographed a male grass spider, *Agelena naevia,* as it waits for its prey.

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Much of the fun of camping in the outdoors is found in the unexpected guests one has in the wilds. Squirrels and chipmunks are frequent visitors and always welcome. Here Carl Naether has photographed an uninvited mantled ground squirrel making himself very much at home.

Cowbirds are notorious enemies of many of our songbirds, sponging on their neighbors. They have the worst domestic habits of all our birds, and possess no parental pride. In the breeding season the mother cowbird goes skulking about looking for a nest in which to lay her eggs. She always picks a nest owned by a bird smaller than herself. The foster parents then raise a youngster larger than their own and this unwelcome child often survives at the expense of the rightful young.

Here Dr. Benjamin Franklin Root records two items of evidence against the cowbird. One shows a cowbird egg in the nest with three eggs of the red-eyed vireo. The other picture shows the nest of a yellow warbler with the side cut open showing three successive additions that the warbler had built to cover up unwelcome cowbird eggs.

"SANCTUARY"—A study of the Goliath Heron.

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Nature in the Photographic Salon

More and more, as the numbers of wild things decrease at the hands of the gunners, are men and women taking up the camera for their shooting. And, with annual photographic salons held throughout the world, camera hunting trophies are occupying an increasing space in these exhibitions. The schedule of these salons is to be found in such magazines as *American Photography* and *Camera,* and Nature photographers should acquaint themselves with them.

All of the pictures on this and the three succeeding pages were taken by Edward R. Osterndorff of the New York Zoological Park. They have all been exhibited at one or more photographic salons, either in this country or abroad. Some have won awards and all are visual evidence of the beauty of subject and composition possible in this field.

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"JIMMY"—A Study of a Shoebill Stork

CANADIAN ELK

Exhibited at the Forty-fourth Annual Photographic Salon, Canadian National Exhibition, Toronto

THE MOUNTAINEER

Exhibited at the Forty-fourth Annual Photographic Salon, Canadian National Exhibition, Toronto

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MANGROVE SNAKE

This striking picture of a South African species was exhibited at the Forty-fourth Annual Photographic Salon, Canadian National Exhibition, Toronto

JUDY, THE LIONESS
Exhibited at the Darby Jubilee Salon,
Darby, England

FURY, THE SNOW LEOPARD
Exhibited at the Darby Jubilee Salon,
Darby, England

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ARCTIC HORNED OWL
Exhibited at the Forty-third Annual Photographic
Salon, Canadian National Exhibition, Toronto

"IN THE WILDERNESS"—

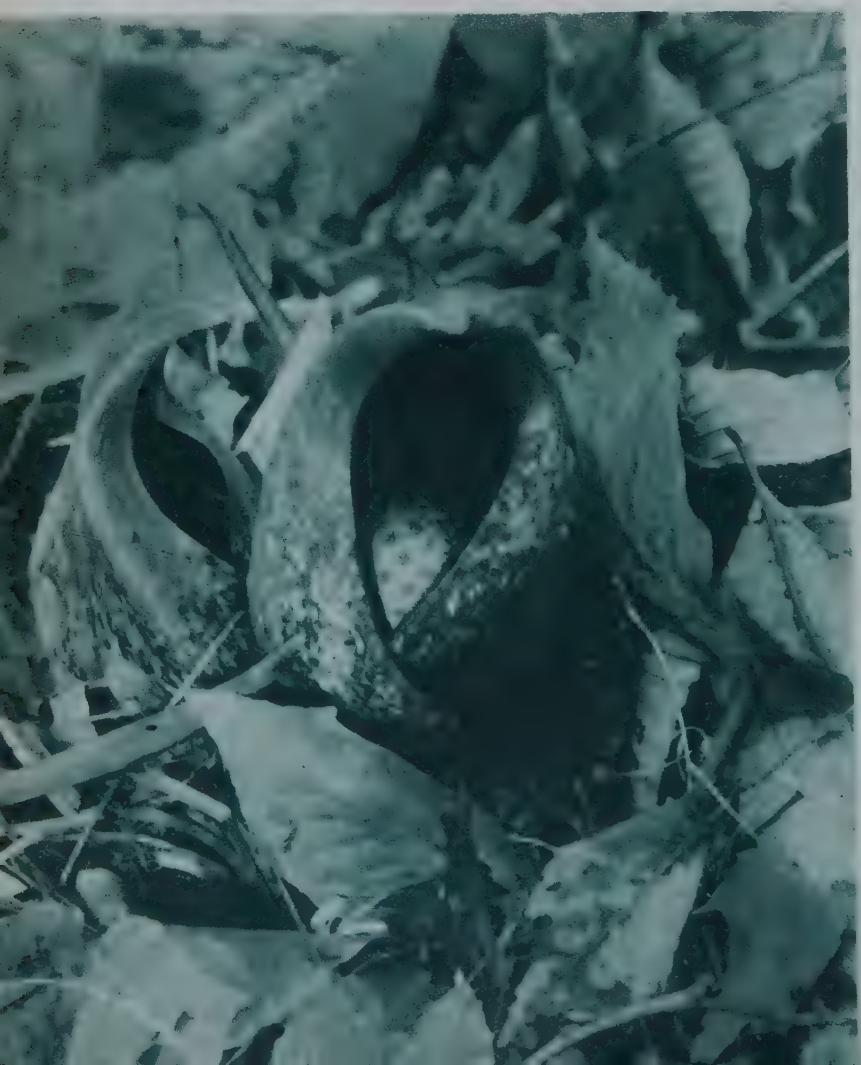
A study of the American Elk Exhibited at the Forty-third Annual Photographic Salon, Canadian National Exhibition, Toronto.

DINGO PUPPY

Exhibited at the Royal Photographic Salon, London.

Mrs. Joseph Watson lives on a farm near Yalesville, Connecticut, and, as may be gathered from this page, has quite a menagerie. Horses, dogs, cats, canaries, finches, mice, rabbits and other pets appear to live in a state of complete accord and happiness.

To many the flowering plants are the only ones worth considering, but this star-moss, with the tips of a frond of shield fern, has a beauty equal to that of many of the higher plants. It makes a lovely pattern on the forest floor. Photograph by Curtis H. Eiffert, Dayton, Ohio.



A sign of spring, the lowly skunk cabbage, although suffering the handicap of a name that is somewhat repellant, pushes up its flower among the withered leaves of last year, and at a time when flowers are all too rare. Photograph by Edward MacArthur, Cleveland, Ohio.

★ Conservation ★

A section of Nature Magazine devoted each month to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.

ARTHUR NEWTON PACK, *Editor*

THE WILDLIFE CONFERENCE ★

The first North American Wildlife Conference is now a matter of history. It was remarkable for its size—more than two thousand people attended the various sessions between February 3 and 7, at Washington. With all due credit to Chief Forester Silcox, who was the President's appointee as Chairman, it was really Jay Darling's conference, inspired by him, dominated by his oratory, his magnetic personality and his leadership. We are delighted that Mr. Darling could at last demonstrate that leadership ability, which during his tenure of office as Chief of the Biological Survey he evidently felt should be subordinated to other necessities. All praise to the man who has dramatized the needs of wildlife, and, in his own words, succeeded in getting the "bow-legged girl invited to the picnic."

The Conference itself actually did nothing for wildlife. It was remarkable chiefly for its potentialities and possibilities for the future, and only that. What real conservation steps are to follow remain in the lap of the gods and the future action of American citizens.

The Conference concentrated on just one objective, the formation of a General Wildlife Federation that is to have its roots in the formation of a local federation for wildlife conservation in every community, county and state. The whole purpose is to bring conservation influence and enthusiasm to bear upon state and federal legislatures in the terms of actual voters to whom politicians will necessarily listen. It is a plan similar to a federation of labor, or to an American Legion type of organization, and bases its faith upon the success of labor and veterans in getting what they want. There is no need to comment upon the theory—the cause of conservation does need this kind of support before it can really accomplish anything.

But what is it that makes so simple an objective appear difficult? What was the *FEAR* that stalked in the anterooms of Washington? Jealousy, selfishness and misunderstanding were all there at this Conference, just as in the past. The highly organized groups of sportsmen feared for their self-assumed dictation in wildlife matters. They studied the proposed outline for a constitution of the federation and read there that *all* groups, societies, and individuals interested in wildlife conservation were to unite in forming the local and, hence, the national federation. The old sportsmen's groups met in conclave and shuddered for their "rights"—full of fear lest the "posy-pickers" and other sentimentalists would overwhelm them. At first inspired with a real desire for getting things done in the best possible way, the sportsmen at the meeting gradually allowed themselves to be dominated by the same old group of self-centered and selfish interests until they finally took the original broad suggestions for a constitution and wrote in several amendments. One of these amendments boldly, directly and deliberately struck at the whole principle of cooperation and getting together. There was a section of Article III of the proposed constitution that stated that local and state federations should be composed of *all* groups, societies, associations, and individuals who desired to come in. "This," the old guard sportsman frankly said, "will sound the death-knell of us sportsmen leaders". And they inserted just one phrase that they thought would save their necks, and that paragraph, when submitted on the floor of the Conference the following day, read as follows: "The representative from a state *must* be selected by a general federation of interests *whose primary purpose is the conservation of wildlife.*

Mr. Darling wanted no argument on the floor. He failed to notice, or deliberately ignored, the little "joker," and, in the outline of a constitution that was passed as "a proposed basis for a future permanent constitution," that joker still remains. Certain of the leaders of the organized sportsmen group indicated that they intended to use it to try to block the formation of comprehensive wildlife federations within some of the states. After the adoption of the temporary constitution, Mr. Darling informally declared that the insertion of this phrase was accidental, that it meant nothing and that it should be ignored. But there is the rub! In view of its origin and intent, will it be ignored?

Members of the American Nature Association, and others honestly and wholeheartedly interested in wildlife conservation have each a definite duty and obligation. It is up to us, *to every one of us,* to try to participate in the formation of the local and state wildlife federations pro-

vided for by the original plan. In all states where there is a Junior Chamber of Commerce that group is the one for each one of us to get in touch with as soon as possible, and see to it that we are included in the formation of the local federation, and that *no* selfish interest gains control. If any such selfish interest should endeavor to invoke against us that "joker" clause above referred to, claiming, on any pretext, that our "primary interest" is not wildlife conservation, it is our duty to call attention to two facts: First, that the so-called constitution was adopted only as a "temporary basis" for a real constitution to be adopted later, and, therefore, has no binding force; and, second, that the phrase, "whose primary purpose is the conserva tion of wildlife" is itself ambiguous and might even b interpreted to exclude a large number of the sportsmer themselves. If any such difficulty is encountered by ou members, we urge them to report the circumstances t the American Nature Association. We are confident tha Jay Darling, as the directing and motivating spirit of th Federation, is one hundred per cent in favor of participa tion by every group and individual in the land who ma have an honest conservation interest. We are certain "Ding" will fight against any and all discrimination with the full force of his power, personality, and influence

THE PLAN FOR REORGANIZING ★

The recent Wildlife Conference *did* set up the machinery for a permanent organization. It *did* pass a resolution calling upon both state and federal governments to give to wildlife the same status, as to expenditure of public funds, as that enjoyed by other natural resources worthy of conservation. Feeling that to go further might endanger the delicate balance of cooperation among those present, the Conference adjourned without taking any other action, and, consequently, *did not* consider the need of persuading the federal government to set in order its own conservation housekeeping.

That subject, however, received some discussion at a group meeting called to consider the Problems of Vanishing Species. At that meeting there appeared to be no difference of opinion as to the desirability of government bureau reorganization. Objection was concerned only with detail, wherein inter-departmental and inter-bureau rivalry was necessarily evident. It was pointed out from the Chair, however, by Dr. T. S. Palmer, that no government bureau is an entity in itself, but has its roots in the citizenry of the nation, who are accustomed to secure benefits through each particular bureau; and that, therefore, "inter-bureau rivalry" and "inter-bureau jealousy" are really matters of the group rivalry and group jealousy of the people. We must deal with the cause as well as with the effect. This is good reasoning. To be sure, it works both ways, and we all know that some government bureau employees, anxious to assure the continuity of their jobs, sometimes stir up and abet the jealousy and rivalry between groups of citizens who are the supporters or "roots" of one bureau or another.

The only way we are ever going to solve the jig-saw puzzle of federal bureau conflict, overlapping and inefficiency is to get together as citizens and realize that it doesn't pay, and that it must be controlled by our own willingness to cooperate for the cause of conservation as a whole instead of for the momentary advantage of our own pet interest in trees, parks, recreation, or commercial advantage. If we *can* agree, as already seems evident, as to the real need of reorganization, how much are we willing to sacrifice of personal advantage or pet theory to obtain progress? This question must be answered

In this department last month we submitted a the oretical federal bureau reorganization plan. Naturally it was drawn up as we saw it in our own minds, and we frankly so admit. We knew that there would be those who objected to certain details, but, as far as we are concerned, we should willingly favor any logical amendment of detail for the sake of the larger end to be accomplished. If the so-called "factions" would get together with only the single honest purpose of the welfare of federal conservation of renewable natural resources, we still feel that a workable plan could be evolved.

There is only one fundamental idea that we consider of sufficient importance to merit argument. That is an emphasis on the difference between "functional" activities and "territorial" administration. There have been governmental reorganization plans proposed from time to time, wherein all forests would be administered by one bureau, all wildlife by another bureau, all grazing of livestock by a third bureau, and so forth. Such plans look beautiful on paper, but the hard fact is they do *not* work. They only engender more conflict than ever before, as is proved by the unfortunate situations that have arisen under the present bureau set-up. Certain activities in the field of research can be functionalized, but, when applied to actual land management, there is no question that the most efficient and economical results are achieved through unity of territorial jurisdiction. In that respect we undoubtedly erred ourselves in suggesting that forests belonging to the Indians should be administered by the proposed Bureau of Forest and Land Management. As long as the territory rightfully belongs to the Indians, then the guardian of those Indians should administer it for them, and Indian forests belong in the Indian Service of the Department of the Interior.

With this explanation of the breadth of our purpose, we again invite all conservation groups to join with us in a renewed demand that the federal government reorganize its conservation housekeeping. We hope that our suggestion for reorganization may stimulate further thought and will lead to a basis of agreement through which there can be won, eventually, a united support for conservation progress. An adjustment of this vexed question will aid in solving many important problems.

THE WILDLIFE FEDERATION—A REPORT

"BELIEVING that the natural resources of the Continent are economic, social, recreational and esthetic assets which should be restored and perpetuated for our posterity, and realizing that this can be achieved only through an aroused and enlightened opinion among the people of this nation, we dedicated this Federation to these ends."

This goal is expressed in the preamble to the temporary constitution of the General Wildlife Federation, the launching of which was the outstanding result of the North American Wildlife Conference held in Washington, D. C., February 3 to 7.

Space does not permit report on interesting addresses presented at the main sessions of the Conference, or comment on the number of valuable papers delivered at the numerous special sessions held concurrently during four days of the Conference. Important as these were, in many instances, they were overshadowed by the business of setting up the framework on which the edifice of the permanent Federation is hoped to be built. On its basal strength will depend its success.

The following are the purposes of the General Wildlife Federation as set forth in its temporary constitution:

(a) To organize all agencies, societies, clubs and individuals which are or should be interested in the restoration and conservation of wildlife into a permanent, unified agency for the purpose of securing adequate public recognition of the needs and values of wildlife resources.

(b) To develop a comprehensive program for the advancement, restoration and conservation of wildlife.

(c) To present to the public such pertinent facts, discoveries and information as may contribute to the solution of the problems involved in the restoration and conservation of wildlife.

(d) To cooperate with other general wildlife federations in other countries on this continent.

This was all accomplished in a spirit of amazing harmony. A proposed temporary constitution was submitted to those present on the opening day of the Conference. This was discussed in state and regional caucuses and finally emerged, appreciably amended, to be adopted unanimously at the business session of the Conference presided over by Jay N. Darling. With equal unanimity the temporary officers and directors of the temporary organization were elected. One lone resolution was adopted by acclaim and is printed on the next page.

Under the constitution of the Federation there is a president and three vice-presidents. Jay N. Darling was elected to the presidency amid applause, and Frederick C. Walcott of Connecticut, I. T. Quinn of Alabama and William L. Finley of Oregon were elected vice-presidents.

The constitution provides that the Federation shall be made up of one representative from each of the several states, the territories and the District of Columbia. Representation is also vouchsafed nation-wide organizations and societies having their principal offices in the same region to the extent that they may have one representative for that region. This limits the representation from such groups to three or four individuals. The representative from a state "must be selected by a general federation of interests whose primary purpose is the conservation of wildlife". Since the formation of state federations is still a matter for completion, the selection of state representatives will take place later. The Board of Directors of the Federation are empowered by the constitution to name *ad interim* representatives from any state, pending formation of a state federation.

Under the constitution of the Federation the country is divided into thirteen regions, each region to have one member on the Board of Directors. Six additional directors will be chosen at large at the annual conference of the federation by the accredited delegates. To carry forward the work of the Federation the thirteen directors were chosen as follows:

Frederick C. Walcott, representing the New England States; N. Marks Bump, representing New York, New Jersey, District of Columbia, Pennsylvania, Delaware and Maryland; A. C. Heyward, representing West Virginia, Virginia, North Carolina and South Carolina; I. T. Quinn, representing Georgia, Florida, Mississippi and Alabama; Kenneth Taylor, representing Tennessee, Kentucky, Arkansas and Missouri; L. A. Colby, representing Ohio, Indiana and Illinois; W. J. P. Aberg, representing Michigan, Wisconsin and Minnesota; William J. Tucker, representing Oklahoma, Louisiana and Texas; Frank J. Brady, representing North Dakota, South Dakota, Nebraska, Kansas and Iowa; Elliott Barker, representing New Mexico, Colorado, Utah and Arizona; William L. Finley, representing Washington, Oregon and Alaska; Joseph S. Dixon, representing California and Nevada; G. W. Grebe, representing Idaho, Wyoming and Montana.

On a roll call, the state representatives reported that federations had already been formed in the following: Alabama, Arizona, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, Washington, and Wisconsin. It is presumed that in most of these cases this is a federation of sportsmen's groups, with which other groups have not as yet been invited to affiliate. This presumption is based upon the fact that preliminary invitations to organize went out to those groups in touch with the American Wild Life Institute, which underwrote much of the cost of the recent Conference.

Under the plan, as Mr. Darling sees it, the central force in the formation of the state and county federations

will be the Junior Chamber of Commerce for the locality or the state. All groups interested in wildlife conservation are, therefore, urged to get in touch with the officers of this organization in their section. In default of adequate information they should address the General Wildlife Federation, which has its headquarters in the offices of the American Wildlife Institute, Investment Building, Washington, D. C.

Under the suggested organization chart brought out preliminary to the Conference, county wildlife federations are envisaged for every county. These would draw together the civic clubs, sportsmen's groups, chambers of commerce, Boy Scouts, Girl Scouts, schools, bird clubs, Future Farmers of America, 4-H Clubs, garden clubs, women's clubs and farm groups. This idea is, we assume, still in effect. The county federations would exercise their influence in the state federations and, through these, in the regional federations.

This, then, is the situation at the time of going to press. The General Wildlife Federation has been launched. It has a fine goal. It has officers and directors. It has headquarters and a temporary constitution. It offers a means through which all individuals and organizations interested in wildlife may become articulate and exercise such influence that proper consideration may be extended to wildlife by legislators, state and national. It will succeed if it is not dominated by one or another special interest; if the lion can learn to lie down with the lamb, and vice versa.

"All things come to him who waits," but we advise hustling while he waits.

The following resolution was unanimously adopted at the formation of the General Wildlife Federation:

Resolved: That wildlife conservation and restoration be recognized as a fundamental duty of all agencies of government, local, state and national, and that we, the participants in this wildlife conference, commit ourselves to the responsibility of bringing to the attention of all citizens, both private and official, the objectives herein set forth.

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A SUGGESTION ★ FOR THE FUTURE

Conservation conferences need to be judged not by their resolutions and their decisions alone, but also by the opportunities they afford for the representatives who attend to know each other, to exchange ideas, and to freshen their own ideals. The recent Wildlife Conference in Washington provided a greater opportunity for this than ever before.

The underlying theme of this Conference was not intended to deal with the various national conservation agencies as separate entities, but only to draw their several channels of influence into a broader effort to organize, from the grass roots upwards, a new and complete federation. The ideal is a worthy one, and it was well that the whole effort should have been concentrated to that end.

There still remains, however, a corollary thought as to how to utilize to the full the opportunities of contact at future national conferences. The new General Wildlife Federation in no way proposes to absorb the entities of the various nationally-organized and nationally-influential groups, such as the societies of mammalogists, ornithologists, biologists, ecologists, foresters, National Park supporters, and a host of others. The General Wildlife Federation will not supplant but will enhance the need for the educational work of the American Nature Association, the Audubon Societies, the humane societies, natural history societies, Nature clubs, conservation committees, Isaac Walton Leagues, and all those groups who have fought the good fight and will continue to do so. The Conservation Departments of the Women's Clubs, Garden Clubs, D. A. R., and similar organizations are vitally important factors in the field of constructive conservation.

There is, undeniably, a real need for better inter-organization contact for conservation work than has ever existed in the past, and in the spirit of get-together, which the organization of the General Wildlife Federation has engendered, we feel that now is the time to consider what could be done about it. Would it not be worthwhile at future annual conferences of the Federation to provide opportunity for a joint meeting of the permanent technical and educational organizations above referred to? Perhaps these organizations should set up a committee for the more ready exchange of information on conservation matters of mutual concern. Disregarding differences and criticisms, and emphasizing only those many points upon which all *can* agree, should they not draw up a list of broad conservation objectives meriting the support of organizations of nation-wide influence? Such action would in no way substitute for the Wildlife Federation, but might secure for that Federation a greater unification of purpose. We invite constructive comment from our members and the members of other organizations.

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A FOREST SCENE AT LYNN FORK OF LEATHERWOOD, KENTUCKY

The exquisite beauty of the forest of the "bottoms," the inimitable massing of shrubbery, the daintiness of ferns combine in a picture of surpassing beauty

The Forest of Lynn Fork of Leatherwood

By E. LUCY BRAUN

LITTLE does the outsider know of the beauty hidden in the mountain section of Kentucky; little does he realize that remnants of the eastern wilderness of the eighteenth century remain in our midst, surrounded by the din, the progress, the civilization of the twentieth century. Yet there are whole counties almost without what today is termed a good road. There are forests that until recently have been too remote to tempt the lumberman; forests where even the walnut remains; forests where even tulip trees, or yellow poplar, tower above their more than average size companions.

The forest of Lynn Fork of Leatherwood is one of these. For several years we had heard of "the big poplar of Perry County," but it was not until the summer of 1933 that we learned the approximate location. We were near enough to attempt the trip, which had to be made on foot down Line Fork to Jakes Creek, up Jakes Creek to its first branch, along a trail up that branch and over the ridge into Stony Fork, down Stony Fork to Leatherwood Creek. There we were to inquire and find a guide if possible. Our course lay down Leatherwood Creek to Lynn Fork; up Lynn Fork, choosing, about one half mile up, the Left Fork; then a sharp climb up through a cornfield, and the narrow trail enters the forest. Somewhere beyond is the "big poplar." But all about is forest, forest of superlative beauty, forest of towering trunks, of luxuriant undergrowth, of exquisite ground cover. Destroying man had never entered here, nor had his animals—hogs or cattle.

Onward and upward the trail leads. Every change of slope is reflected in changing composition of the forest. Here white oak prevails, massive and tall, columns four feet in diameter. There, on a protected slope where ledges of sandstone outcrop, the whole aspect changes; hemlock mingles with the deciduous trees; the dense summer-green understory opens up; few of the delicate herbs of the deciduous forest thrive in the deep duff. The forest of the deeper valleys is in places unbelievably dense, scarcely a ray of sunlight penetrating the dense canopy; rhododendrons clothe the lower slopes, obscuring the little stream from view. Or, in "bottoms," it opens up and the lighter crown of red maple seems to permit the entrance of more light. Mountain magnolia and oil-nut, with here and there a mass of mountain laurel, are grouped with such perfection of design as only the Master Hand could plan. And all between are beds of ferns.

To the right is a tributary valley and up this we turn, for the "big poplar" grows at the foot of the last rise, well up at the head of the valley. Soon the forest changes again. We are entering a veritable cathedral, its roof up-

held by huge towering columns —the tall and stately tulip trees. Where before they had been scattered, rising here and there between the other trees, now they outnumber all others, sheltering in their shade large beech and sugar maple. The herbaceous growth is even more luxuriant than before; masses of narrow-leaved spleenwort and silvery spleenwort, waist-high, are all about. Hidden more or less by this luxuriance, and inconspicuous because past blooming, are yellow lady's slippers and showy orchids.

The leaves of trillium, bellwort, phlox, spotted mandarin, buttercups, foam-flower and a host of other spring-flowering plants stirred our imagination and painted the hillsides in spring bloom. But dominating all is the primeval grandeur of a forest. Each changing vista brings to view additional large tulip trees, each larger, it seems, than those before. And then, ahead, rises the majestic column of the "big poplar"—straight, sound and perfect, towering eighty feet to the first branch, lifting its crown far aloft. In reverence and awe we stood and gazed upon this tree, the *largest living individual* of its kind in North America. Such monarchs of the forest are not grown in decades, nor yet in centuries. Few but the mountain folk had ever seen it, even knew of its existence. If the people of this nation loved and revered this splendid tree as do those mountain people—they once held church service in this cathedral of Nature—its safety would be assured. It would not, as now, be threatened with destruction as is all this splendid forest. Only through purchase by the gifts of public-spirited, Nature-loving citizens can it be saved.

IN THE PRIMEVAL HARDWOOD FOREST OF KENTUCKY

Up the slopes, as far as the eye can see, are towering trunks of tulipo trees, while all about masses of narrow-leaved spleenwort lend charm and delicacy to the ground cover

Realization of the irretrievable loss that will result if our last remaining stands of virgin deciduous forest are cut prompted the formation of the Save-Kentucky's-Primeval-Forest League, with its first objective the saving of the forest of Lynn Fork of Leatherwood for posterity as a monument of the primeval. We need the help of every lover of the primeval forest. In the words of Theodore Roosevelt:

"There is nothing more practical in the end than the preservation of beauty, than the preservation of anything that appeals to the higher emotions of mankind."

Here we have, in the words of one who was in the foremost ranks of those who battled for the preservation of beauty and who was also a veteran in the advocacy of practical ends, an assurance that there is no conflict between these two objectives. We need a more general realization of this principle in our multiple activities.

If this reasoning can be invoked in the campaign to save this particular forest, it will turn the tide. The Forest of Lynn Fork of Leatherwood is a thing of beauty; it appeals to the higher emotions of mankind.

EDUCATION FOR CONSERVATION

Education Commissioner Studebaker proposes service to arouse understanding of wild life preservation in schools

"IT WOULD seem that while the Federal and State Governments are engaged in the terrific and somewhat disheartening struggle to repair by direct methods the damages which have been done to our forests, lands, streams and wildlife by the ignorance and indifference of our citizens, a small appropriation for education, through which there can quickly be put into the minds of millions of people the challenge to conserve what we have left and to rebuild our lost fortunes, would be the most profitable of all investments."

These were the words of J. W. Studebaker, United States Commissioner of Education, in one of the most thought-provoking of the many addresses delivered at the North American Wildlife Conference. He echoed the sentiment we have expressed frequently in these pages when he declared that "the schools of the country, with their enrollments of tens of millions of learners, should become the most important ally of the agencies primarily interested in the conservation of our national resources."

We are now in the midst of a concerted effort toward conservation and restoration of wildlife. In one way or another this will—*must*—succeed. It is our solemn responsibility to hand on to the rising generation more of these natural resources than we have today. At the same time we must recognize the vital need of informing those who will come to take our places, in order that they may wisely use and further increase these resources. Conservation education is the answer to this responsibility.

There have been faint stirrings in this direction. Wisconsin, for example, has passed a law requiring the teaching of conservation. It would appear, however, that they left it at that and set the teachers of the State adrift to fulfill the requirements of the law according to their individual abilities and ingenuities. Here and there conservation has come in for passing consideration as a part of studies of biological and social sciences. Yet, as Mr. Studebaker emphatically pointed out, the least consideration has yet to be given to the subject at the great semi-annual educational conventions. The American Nature Association has received from progressive teachers many appeals for advice as to how they can bring conservation into their school classes. To that end a suggestive and necessarily brief booklet is being prepared.

However, in his address, Mr. Studebaker came forward with a specific and important suggestion. He proposed the establishment of an educational service on the Conservation of National Resources in the United States Office of Education. This, he asserted, would assist the Federal Government in arousing interest in and disseminating information about conservation; would provide school officials with curriculum material.

"To be effective in educating the nation concerning conservation, the information disseminated must meet three requirements," Mr. Studebaker declared. "First it must have genuine scientific authenticity. Second, it must be organized for school use by professionally trained and experienced curriculum specialists in conformity with State and local curriculum offerings. Third, it must find its way to the pupils through the regular channels provided by the Federal, State and local educational agencies."

Scientific authenticity is vital in any education and especially so in conservation. Proved facts about the condition of our natural resources must be the basis of the material supplied and not information based upon selfish interest and, therefore, colored or distorted. The task of training specialists on curricula who can, at the same time, recognize the true from the false in conservation information, will take some time. Such training is important and demands a background of conservation study as well as a knowledge of curriculum methods.

Mr. Studebaker's third provisions would seem to imply a monopoly on supplying the information to the schools. There are, today, many authentic and valuable sources of conservation material which, while not prepared in strict pedagogical form, are immensely valuable for reference purposes and collateral study. These should not only not be overlooked, but should be used to the utmost.

We are acutely mindful of the fact that there is a large amount of material, some of it well printed, attractively illustrated and widely circulated, that is masquerading under the guise of conservation education. We refer to a class of literature that will be recognized by all as based primarily on commercial interests. While it is possible in many cases to harmonize commercial and conservation interests to an extent that does little violence to the goal desired—the greatest good to the greatest number—the fact remains that this goal is rarely achieved. We see instances of its failure on every hand—projects that are conceived and consummated by minority groups without consultation with the majority of the citizens who will be affected by the undertakings. Under such circumstances it is inevitable that injustice, both to wildlife and to many classes of citizens, will result.

Mr. Studebaker makes a definite estimate of the cost of setting up and maintaining such a service in the Office of Education. He sets a figure of thirty-five thousand dollars a year. Either he has come off second-best in battles with the Budget Bureau, or he does not realize the immensity of the task or the tremendous need. Multiply his figure ten times, and launch similar educational programs in the States, and we would have a good start.

Here is a splendid task for the General Wildlife Federation, which has dedicated itself to getting adequate appropriations for wildlife conservation.

COMMENT IN THE PRESS

KEEN interest of the newspaper editors of the nation in all phases of conservation is shown by the many wildlife editorials that have come to our attention.

Commenting on the suggestion of Arthur Newton Pack for federal bureau reorganization under a centralized Bureau of Conservation of Renewable Natural Resources, the Fond du Lac (Wis.) *Reporter* says: "The proposed program appears a logical step in advance. The adoption of some uniform program based on a principle such as Mr. Pack suggests would be of material benefit."

Another editorial from a feature service appearing in approximately 400 dailies says, in part: "Arthur Newton Pack, president of the American Nature Association made an intelligent comment when he declared that the wildlife of the country belongs to all the people and not solely to the minority that hunts. There is a great deal in what he says. The hunter is not the only citizen who has a direct interest in our bird and animal life. The conservation of that life is a national problem, on which every class of citizen is entitled to be heard."

In the opinion of the Duluth (Minn.) *News-Tribune,* "a permanent policy of wildlife conservation should be agreed upon and should be given legal status by an act of Congress."

"We regret to say," says the Suffolk (Va.) *News-Herald,* "that love of wildlife is not entirely the motivating spirit in these movements. It is in fact the inherent desire in man to kill."

Somewhat pessimistic is the Lincoln (Ill.) *Courier and Herald.* "A great deal of lamenting goes on among sportsmen and in the Nature magazines about the passing of wildlife, but nobody seems to be able to do anything very tangible about it." They do say, however, that "advocates of conservation will applaud a bit of intelligent comment made by Arthur Newton Pack, who said the wildlife of the country belongs to all the people."

In the Detroit (Mich.) *News,* Albert Stoll, Jr., conservation authority, commenting on the plan for consolidation of bureaus, says: "This consolidation of activities has been suggested before and is highly desirable. * * * we do know that confusion is certain to arise when allied conservation activities are administered by three different governmental departments, as is now the case * * * if they were all placed under one head no doubt greater progress and efficiency would result."

These comments, selected at random, show that the editorial pages of the nation's newspapers can be a great educational medium for presenting the conservation problem to the people.

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THE BILLBOARD BATTLE

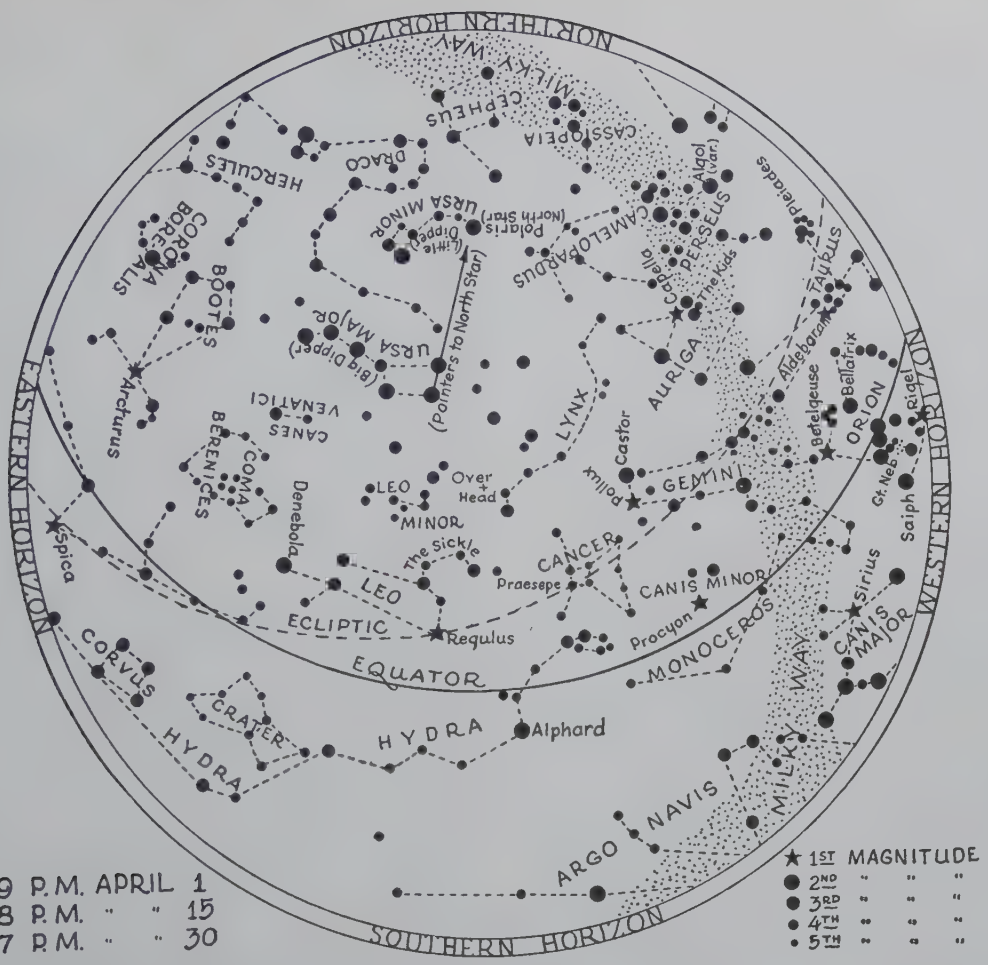
FACED with the unanimous and far-reaching decision of the Massachusetts Supreme Court against them, the billboard interests filed notice of appeal with the Supreme Court of the United States. They called into conference eminent lawyers, including John W. Davis, to consider the presentation of their case. After obtaining delay to permit the filing of briefs, the industry, on advice of counsel, filed a motion for dismissal of their appeals and gave up the fight.

This is a victory for those who hold that it is in the public interest to regulate and restrict this parasitical growth on the countryside of America. The Massachusetts Billboard Law Defense Committee, which led the fight in defense of the State law, asserts that "it is now reasonably safe, under the United States Constitution, for any state to invoke the police power in laws to restrict unsightly advertising on private property, and to delegate like powers to cities and towns."

The Massachusetts Committee now urges the communities to enact by-laws making the regulation of outdoor advertising effective. James Michael Curley, Governor of the State, has threatened to revise the billboard regulations in the interests of the advertising companies, and has packed the Board of Public Works to that end. Mr. Curley recently became the father-in-law of the Donnelly Company, the largest outdoor advertising company in New England, so it is a matter of family interest as opposed to the public interest. The latter interest, however, has the weapon of the ballot and thus is able to meet such issues effectively.

In New York there is pending before the Legislature the Desmond-Potter Bill to control and regulate outdoor advertising. This measure places enforcement in the hands of the Superintendent of Public Works under the Division of Highways. It provides for setbacks ranging from 50 to 300 feet for all billboards already erected; requires billboards to be 500 feet away from intersections of highways or railroads and more than 200 feet away from any curve; eliminates billboards in series, in motion or displaying intermittent lights. Governor Lehman, in his 1936 message to the Legislature, declared that "the State should regulate billboards and structures and service trades along State highways to preserve the beauty of our countryside and to increase highway safety and efficiency."

The people of the State of New York have the right to protect themselves against the menace to safety and good taste represented by unrestricted billboards. Members of the American Nature Association in New York are urged to support the New York State Committee for Billboard Legislation, a group representing many statewide and local groups, and to write to their Assemblymen and Senators asking that this measure be enacted into law.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

Our Place in the Universe

By ISABEL M. LEWIS

IN THE light of the discoveries of modern astronomy it seems quite unthinkable that less than three centuries ago men were holding bitter and heated controversies over whether or not the earth moved! It was a tremendous step forward to realize that the sun and not the earth was the body about which the planets were moving and that our own planet was not the hub of the universe. That the sun itself was a star was believed by Huyghens, who was also a believer in the plurality of worlds. He made telescopes far more powerful than the best of Galileo's "optik" tubes and with them discovered the largest satellite and the rings of Saturn. He was one of the great pioneers of modern astronomy.

The word "universe" has been used with different meanings among astronomers of modern times and this has led to some confusion as to just what is meant when we speak of the universe. The use of "island universe" to describe those far away spiral nebulæ, or extra-galactic nebulæ, has added to the difficulty, also the fact that we speak of such things as the "Kapteyn universe", the "Shapley universe" or "the De Sitter universe", all different conceptions. At the beginning of the present century, Kapteyn, a noted Dutch astronomer, from a statistical study of the stars, their numbers, distribution, and motions, both in and across the line of sight, discovered the existence of two vast interpenetrating streams of stars flowing in opposite directions. This was confirmed later by other astronomers. It has been explained by Shapley as due to the interpenetration of two star clusters which has formed the so-called Local Cluster to which our own sun belongs and through which it is moving at the rate of about 12½ miles per second in the general direction of the constellation of Lyra. The extent of this local cluster is about three thousand light years. It consists of all the brightest and nearest stars, especially the brilliant helium or Orion-type stars, so called because all the brightest stars in Orion with the exception of Betelgeuze are of this type. In the Local Cluster are to be found the

open star clusters, such as the Pleiades in Taurus, and Præsepe, in Cancer, called open because they have no central condensation. This great local cluster is flattened, or bun-shaped, and is inclined at a small angle to that far greater aggregation of stars and nebulosities known as the Galactic System, the Milky Way, or Galaxy, of which it forms a part, and to which it is subordinate.

According to Shapley, "the Galactic System is an irregularly circular and much flattened system—a conglomerate of single stars, groups of stars, clusters and great star clouds, seriously obscured in certain regions by nebulosity." Its center lies among the star clouds of Sagittarius and there is no evidence of any central sun. Our own sun, a dwarf sun in the local cluster, lies many light years distant from this center. The longer axis, or central plane, of the Galaxy is about twenty times its greatest width and probably has an extent of 100,000 or more light years.

Outside the Galaxy, above and below its plane and at enormous distances from it, lie other cosmic units. They include the great globular star clusters, the Magellanic Clouds, the spiral and other extra-galactic nebulæ, which go to make up what we may call the universe in the sense of the "whole reality".

The globular star clusters, over one hundred in number, are globe-shaped clusters of stars at distances from the earth ranging from 22,000 to 220,000 light years. They have a peculiar distribution since they form a great roughly circular system divided by the plane of the Milky Way. A typical globular cluster consists of 50,000 or even 100,000 stars and has a diameter of 100 light years more or less. They are much nearer to the Galactic System and much smaller than other units external to the Galaxy.

In addition there exist, beyond our galaxy, countless objects known as spiral nebulæ, or extra-galactic nebulæ, which are great systems of stars and nebulosities comparable in size to our own Galactic System. These are often called Island Universes. Their distances are of the order of millions of light years. The nearest of all of them is the Great Andromeda Nebula which is distant about 800,000 light years. Unlike practically all of the others, it is approaching us.

It has been one of the most remarkable discoveries of modern astronomy that these island universes are receding from our own galactic system at speeds that increase with distance. The conclusion drawn from this fact is that the universe is expanding, and according to the theory of relativity it is to be expected that this would be so.

During the past four years the apparent velocities of one hundred extra-galactic nebulæ have been obtained at Mt. Wilson. With very few exceptions they are receding, as found in previous investigations of similar objects, and the velocities range from a few hundred miles per second for the nearest and brightest to *25,000 miles per second* for two clusters, one in Bootes and the other in Ursa Major. These are estimated to be at distances of over two hundred million light years. This is additional proof of the existence of an expanding universe. These extra-galactic nebulæ tend to cluster in greatest numbers near the poles of the Galaxy, especially the north galactic pole and its surroundings in Coma, Virgo and Ursa Major. In this region there are clouds of galaxies, misnamed spiral nebulæ, that are about ten million light years away. In the constellation of Centaurus there is a similar cloud about one hundred and fifty million light years distant, considered to be the greatest of all known systems. It consists of large numbers of smaller galaxies, connected, but each distinctive. The name of super-galaxy has been applied to such a system of typical galaxies. It has been suggested by Shapley that our own galactic system, which appears to be too great in size and extent to be considered a typical galaxy, such as the Great Andromeda Nebula, may be such a super-galaxy. Our local cluster appears to be a galaxy similar to the Magellanic Clouds, or any typical extra-galactic nebula, and the far distant star clouds of the Galactic System may be similar to this local cluster in which our own solar system lies.

The De Sitter Universe, or the Space-time Universe, as it has been called, is a concept deduced from the theory of relativity by the noted cosmologist, De Sitter, late director of the leading observatory of the Netherlands. It is supposed to comprise everything that exists. Finite, yet unbounded, it is estimated to be 2,000 million light years in radius, ten times as great as the most distant object photographed in the 100-inch reflector at Mt. Wilson. Based on deductions from the theory of relativity as to the amount and distribution of matter in the universe, De Sitter estimated that it contains 80,000 million galaxies. Combined with the estimate that our own galactic system is populated with 30,000 million stars, this De Sitter Universe, representing the whole of reality, contains something like 80,000 million times 30,000 million suns if our system may be considered a typical one. A staggering conception in which our tiny world plays the part of a dwarf planet revolving around a dwarf sun which is in turn a stellar unit travelling along its own appointed path in the Local Cluster probably some 50,000 light years from the center of the Galactic System! The pioneers of astronomy in their wildest dreams would never have visualized this conception of the universe, based upon the discoveries made possible by modern instruments of research.

In April evening skies we may see the region of the galactic pole and its surroundings in Coma, Virgo, and Ursa Major. The planets Mercury, Venus and Mars are all too close to the sun for observation this month. Jupiter is coming into the evening sky and rises shortly before midnight. Saturn is low in the southeast at sunrise and poorly placed for observation.

Trailside Treasures

MR. HOPPY STEPS OUT

By JANE ADAMS PARKER

"My, how our rock-garden and pool do grow," said Rosy. "Just one month ago, there wasn't anything here. And now look—"

Jackie Knight sat in his wheel-chair, and his face fairly beamed with happiness.

"It's been such fun, watching you folks make it grow," he said. "I just love those ferns Jo's planting around the pool! They always look so cool, even on a real warm day, Mother says. It must be great to go hunting for treasures through the woods. But I guess it's almost as much fun to have the woods come to you, this way. Especially after Ben put up my shelf for the birds. They come and wake me every morning, calling for their breakfast."

"It was Aunt Dot's idea," said Jerry. "But we've all had fun doing it, too. And we've learned a lot about the wild flowers."

"When you see just two grayish-green leaves, spotted with a darker color, poking up like those, over there by that rock," said Rosy, "you know it's an adder's-tongue, sometimes called dog-tooth violet. And that plant with three dark green, oval-shaped leaves just beginning to show on the stem is a trillium. It'll be a white flower with three-pointed petals, set down in the middle of the three leaves."

"And that plant with the leaf rolled right around the flower-buds is a bloodroot," said Jo. "The leaf is a big jagged one with heavy veins. And the flowers seem to push themselves up through the leaves where folks can see how pretty they are. They're white with yellow centers. When you break the stem of the bloodroot it bleeds."

"That little patch by Jo's ferns is going to be a bed of shooting-stars. I know Jackie will love it. Maybe it will be in blossom next time we come over," said Aunt Dot.

"Did you find out anything about the little brown cradle, I found with the queer handle on the side?" asked Jerry.

"Yes," answered Jackie, "I did find out something from a book your grandpa brought me. But I haven't quite decided what it is yet. Mother says it'll be coming out to introduce itself before many weeks. Why did you call it an, 'underground cradle'?"

"Well," Jerry grinned, "that's something else you'll find out later on, too."

BEN LIFTED UP AN OLD FLOWER CROCK IN THE GARDEN AND OUT STEPPED MR. HOPPY

"Here's a little friend Ben found yesterday," said Jackie, reaching across to the table to pick up a large box covered with netting.

"Mr. Hop Toad," squealed Rosy. "He's not so very old, I guess, because he's quite small. Where did he find him?"

Jackie laughed. "In the queerest place," he said. "Ben lifted up an old flower-crock out in the garden, and out stepped Mr. Hoppy. I call him that. Just look at his eyes through the magnifying-glass. They're like marbles almost."

"Aren't they beau-ti-ful!" said Jo, squinting her eye to look closer. "Maybe he's older than you think. Grandpa says it takes toads a long, long while to get to be real big. Anyway, he's old enough to have his skin all wrinkly, with little bumps like warts on it."

"When a baby toad is quite tiny," said Aunt Dot, "its skin is so tender that even the hot sun hurts it. So it usually burrows into the moist earth until almost dusk."

"And when a toad changes its skin," said Jerry, "it's so funny. First it splits down the back, then under the sides. After a while Mr. Hoppy pulls it right off over his head."

"Maybe not quite so easy as all that," said Grandpa. "He does a lot of squirming and twisting, and helping first with his hind-feet then the fore-feet, before he manages to get it off."

"Then what do you suppose?" said Aunt Dot. "He swallows his old skin, rolling it up first into a ball. And he doesn't even chew it up, because he hasn't a tooth in his jaws."

"He's a good little friend, even if his dark, clumsy body isn't beautiful," said Grandpa. "He eats all sorts of insects that kill things in our gardens."

As it was time to go the children gathered around Jackie's chair to say, "good bye." Suddenly a little twinkle popped into his eyes, "Next time you come I'll have a surprise for you," he said. "Daddy's going to bring it home tonight."

What do you suppose the surprise was? And what was Jerry's queer little underground cradle?

(To be continued)

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Billie Whiskers—A Squirrel

By YVONNE McCANDLESS

Billie Whiskers was left an orphan soon after he was born. He was less than two inches long, tail and all. Except for his size, he looked exactly like a naked, gray-blue newborn rat. His eyes were closed tight and his ears were very tiny. Over his broad mouth he had a faint line of orange fuzz.

He was a silent little fellow and made no sound except when we put him out into the cold, a few minutes at a time, in the hope that some other squirrel mother would adopt him and carry him to her nest. Then Billie Whiskers sounded exactly like a squeaking toy rat, only louder.

From the first Billie Whiskers readily drank his malted milk from a medicine dropper. But as we had no idea how much a tiny squirrel like Billie might have, we overfed him. He became like a balloon and didn't seem comfortable. We kept him warm by the stove during the day and put him in bed with one or another of the family at night, basket and all!

For the next few days I did little but play nursemaid to Billie. He was fed every two or three hours from early in the morning until late at night. But on the fifth day after we had adopted Billie Whiskers, Peter Petrushka, our cat, had two kittens, Dinah and Tail Light. I rubbed our little squirrel against the kittens so that he would smell like them and then put him in the basket with the mother cat. I had seen Peter try to catch squirrels and wondered what "he" would do.

Peter "murrrrped" his tenderest welcome and straightway began to wash Billie Whiskers from head to tail. It was quite a bath for so tiny a fellow, but he seemed to enjoy snuggling in the warm fur of Peter and the two kittens. As soon as he had adopted Peter as his foster mother, Billie refused the medicine dropper entirely. Now, instead of getting too much food in too short a time, he seemed to get little nourishment. However, he made up for it by nursing all the time he wasn't sleeping. He immediately improved in looks, and was clean and nicely round and fat.

The kittens had their eyes open between the seventh and the ninth days. Billie Whiskers' eyes did not begin to open until he was about three weeks old. The kittens were active from the first week. Billie Whiskers, at three weeks of age, still liked to sleep nearly all day.

When Peter meowed it meant nothing to Billie Whiskers. The kittens' meowing Peter understood, of course, but when the squirrel was sat on and grunted in protest, Peter did not understand a word of it and kept on sitting.

When Peter brought home a mole and gave it to Billie Whiskers, his favorite, Billie paid no attention to it. But he early liked the smell of nuts and sugar, which meant nothing to the kittens.

Early the fourth week, Billie's eyes opened. That same week he learned to "chuck chuck chuck" in squirrel language. He quickly froze to attention every time he heard squirrels scolding outdoors. After Billie Whiskers' eyes were open he began to respond to the kittens' attempts to play with him. He loved to bite their toes with his sharp teeth.

Of course, day by day, the ring of fuzz around Billie Whiskers' muzzle, increased in area. Soon his whole head, back and tail were covered with soft brownish hair. Then his tail began to bush out and he became very active. He ran and leaped from place to place, curious about everything. He explored everything first by chewing at it.

Almost overnight Billie became beautiful. He sat gracefully on his haunches and enjoyed curling his tail up his back as he toyed with walnuts or almonds. His ears were lovely furry things and his face was no longer pugnosed, but almost pointed with a black and inquisitive little nose always pointing the way to new mischief.

Strangers easily frightened Billie. Otherwise he felt much at home in the house. Until shortly before he left us, he did not mind being handled by any member of our family. When Billie Whiskers wasn't lying side by side with the kittens, nursing, he was often asleep under one of our pillows where he took his nap every day, as if by the clock, from eleven to twelve in the morning and from three to four in the afternoon.

While Billie Whiskers lived in the house with us he was a daily circus. Sometimes he and the kittens played tag for hours; upstairs; downstairs; over furniture; up and down window screens. Billie thought nothing of clinging to the ceiling beams and then leaping upon the head of a visitor. He dragged off ties, handkerchiefs and socks, and hid them in a hole in the wall where the electric wires were being repaired. He chewed up manuscripts and music. He danced over piano keys and typewriter keys. He carved on the piano, picture frames, looms, anything of wood that took his fancy. He and the kittens played hide and seek for hours in an antique pottery churn, in Billie's nest.

Billie Whiskers helped himself to food from our plates at the table and ate what he could and the rest he hid in our pockets, in the bed or in our shoes. He was everyone's pet. Peter weaned his kittens, but Billie Whiskers could nurse until he made a home of his own out in the trees.

One day he wanted to go out of doors and out he went. That night he came back. He begged to go out early the next morning but soon he was living entirely out of doors. At first the other squirrels chased him and would have nothing to do with him, but soon after he moved to his own green nest up in an elm, they played together.

Now Billie Whiskers has a nest and a family of his own in a tree right by the house. He is no longer friendly with Peter but scolds "him" as all the other squirrels do. Nor does Billie Whiskers sit on my shoulders any more but he does hang by his hind legs from a low branch now and then and he swings himself to and fro and yawns lazily, as of old.

Nature Magazine in School

A Department of Aid to the Teacher

Springtime With Nature

This delightful article, an artist's word picture of the coming of spring, could be read with keen pleasure by older pupils and teachers. From it teachers of younger children could gather information that might be used as the basis of reading units, which they could rewrite in the language of the particular grade. In addition they could use the article as a check on their own knowledge in such science activities as making a calendar of birds as they arrive in spring, recording the date and the bird seen, where seen, and what doing; of wildflowers, giving the name of the flower, the date first found, and where growing; of trees, indicating when they come in leaf, which appears first, flowers or leaves, and perhaps showing a drawing of the leaf as it first appears and as it looks when it is mature. This type of instruction should be spontaneous, taking only a few minutes to record from day to day. If it becomes drudgery it should be dropped at once lest it cause pupils to dislike the subject. Some pupils who desire to do so should be encouraged to keep this type of information in notebooks. However, notebooks, if compulsory, are often the means of killing interest in science and the over-use of them should be avoided by teachers. Making and exhibiting posters of the birds, flowers, trees and other phases of wildlife recorded on the calendars and notebooks is another means of impressing young pupils with the variety of living things that surround them in the spring.

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Spring and Hepaticas

This well-written article on the hepatica presents many interesting facts useful to teachers. It tells where this flower may be found, something of its structure, and habits of growth. As it is more hardy than most of the wildflowers and is also very attractive, it is satisfactory for school use either in an indoor "flower garden" or in the wildflower section of the school garden. Of course it would be desirable to learn to know the hepatica in its natural environment. Fortunate is the school which is located near enough to a woods or park for teachers to take their pupils to find the first hepatica, to hear the birds sing, to feel the warm sunshine, to smell the delightful odor of the awakening earth and to see the delicate colors that envelop the trees.

When such excursions are not possible any teacher can in some cases bring something of the spring into her classroom with sprays of flowering shrubs or growing plants. The old fashioned sand table makes a fine site for an indoor wildflower garden. Hepaticas and most woods flowers are easy to transplant if one is careful to dig deeply all around the plant so as to be able to lift it with a ball of soil attached to the roots, and if the soil in the new location is somewhat acid.

Later, when the indoor garden is dismantled, it is good conservation teaching to replant with care these flowers in the woods.

In order that teachers and parents may further use Nature Magazine as an aid to the study of Nature and Science, this page is devoted to the following brief notes based upon articles in this issue and suggesting ways in which they may be used as a source of inspiration and information. To bring these Nature study thoughts to our readers we have obtained the services of one eminently qualified for the task, and this department is edited

BY ESTHER SCOTT

Instructor in charge of Elementary Science Washington, D. C., Schools

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Frog Hunting With a Microscope

What a delightful way to learn the stages in the development of eggs and what a practical background of information for the understanding of the function of sex in life!

This article would be useful in any level of the school system; in the elementary school for those biologically inclined students whose parents have equipped them with microscopes; in the junior high school it suggests a splendid series of activities related to the spring unit dealing with living things. In the senior high school pupils would welcome a biology class conducted along such lines.

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Oscar, Jaybird Extraordinary

If grown up men can get so much pleasure from a pet blue-jay, how much more could children? Really, we owe it to our children to provide them with pets both at home and at school. In the recent North American Wildlife Conference held in Washington, D. C., Mr. John H. Baker, the executive director of the National Association of Audubon Societies, quoted a noted juvenile judge who claimed that in his experience not one single child convicted of delinquency had any appreciation of nature.

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A Winter Wren Guest

This interesting story of a man and a migrant bird would inspire anyone who could read it with a keener appreciation of birds. It could be told to younger children.

In schools located where there are birds to feed, this activity will be found to be very worthwhile, not only for the interest in birds which it arouses but because of its contribution to character education.

Pupils can not, of course, become so well acquainted as did the author of this article and his little winter wren, but they do get to like the birds they feed and to feel an individual responsibility for their well being.

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The Rotogravure Section

In the early grades of the elementary school or even before they go to school, children often become interested in cloud shapes. Pupils who desired to do so could start a collection of cloud pictures as is suggested under "The Cloud Museum". They might even write down observations such as an account of the kind of weather observed immediately after a certain type cloud has been seen. Such a collection and notation would form a good basis for the work on weather usually given in the junior high school science course.

These older pupils might predict the weather from the appearance of the clouds and keep a record to determine their accuracy. A study of the factors involved in weather forecasting would develop into quite an extensive study of weather, and might be an effective way to introduce the unit.

●

Our Place in the Universe

This article, presenting a very accurate and concise picture of the stellar universe, gives the foundation facts for a unit of work covering several weeks on the junior high school level.

There is nothing more uplifting than the contemplation of the universe, and nothing more broadening in its effect on the mind of a student.

Such questions as, "How many stars are there?", "What is the milky way?", "Is our sun the largest sun in the universe?" could be used to lead the pupil into a better understanding and appreciation of the size of the universe, its shape, the place of the sun in such a system, the question regarding a possible center around which the sun and the stars revolve, and the distribution of the stars. Throughout such a study reference should continually be made to the change in the conception long held regarding the universe. This subject illustrates very splendidly the fact that man's conception of truth does change. The answer to the question, "What is the center of the universe?" would have been given very differently by Aristotle, Ptolemy, Copernicus, Kepler, Herschel and Shapley. Recently, DeSitter has advanced the theory of an even more extended universe.

At the conclusion of the unit, pupils could check up on the ideas held by these men and represent them in a panel discussion on this question. As a program for a school assembly these characters might be dramatized in a program representing the march of truth.

●

Billie Whiskers

Here is a story of a pet gray squirrel, another illustration of the charm that this animal displays as a pet. Squirrels have a high degree of intelligence and may be easily tamed. A few nuts gently offered may serve to win their confidence. Very young squirrels may be raised on cow's milk fed in a medicine dropper or nursing bottle. It is by way of such experiences that teaching becomes just living, the mechanics of reading become desirable, and oral and written language improve under the urge of self expression.

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Izaak Walton League Convention

One of the highlights of the Izaak Walton League's annual convention, to be held April 16, 17 and 18 at the Hotel Sherman, Chicago, will be discussion of the means of controlling stream pollution. Particular emphasis will be placed on the Water Pollution Bill, recently introduced in Congress by Senator Augustine Lonergan of Connecticut.

Another important problem to be discussed will be that of adequate recognition of wildlife as a natural resource on the public domain of the West. Means of strengthening the support of wildlife conservation through the newly formed General Wildlife Federation also will be given attention.

New York Animals

A liberal education on the small mammals that inhabit central New York State can be had by reading Volume 4, Number 1, of the *Roosevelt Wild Life Annals* bulletin published by the New York State College of Forestry at Syracuse University. This bulletin, complete with illustrations, gives full information on the behavior, disposition, range, sociability, size, nesting instincts, food eaten and population per acre of the small mammals of the interior of the State. Editions of these publications are limited and do not permit of general free distribution, and prices are based on actual cost of printing. For further information write the director and editor, Roosevelt Wild Life Forest Experiment Station, Syracuse, N. Y.

Narcotic Doves

There have been instances of birds becoming inebriated by eating the berries of certain plants, but a dope fiend dove is a rarity. In the flower garden of Miss M. J. Gasmann, of Amherst, Wis., several mourning doves were found quite tipsy from eating poppy seeds. The birds rolled on the ground in apparent ecstasy, unable to fly until the effects had worn off.

Nature Course Offered

A two weeks' field course in natural history, sponsored by the American Museum of Natural History and the garden clubs of Long Island, will be given by the Division of General Education of New York University beginning Sunday, July 5. The course will include daily field trips and evening laboratory work, emphasizing interrelationships and interdependencies in Nature. Intensive studies of trees, flowers, birds, insects, salt water life and geology will be made. The State Institute for Applied Agriculture at Farmingdale, Long Island, will be the headquarters for the course, offering the nearby Cold Springs Harbor laboratories, Roosevelt bird sanctuary, state fish hatchery, Jones Beach bird sanctuary, Massapequa and Belmont parks for places of study. Further information on the course can be obtained from Miss Farida A. Wiley, American Museum of Natural History, 77th Street and Central Park West, New York City.

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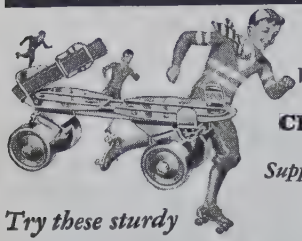

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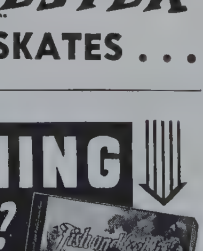

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Says Sir Claude Schuster: "To be really wet through is the most luxurious of sensations. . . . A blanket for your garment, your naked toes against the fire bars, your dripping garments playing a symphony on the top of the stove, and who shall ask more of fate or lament a lost mountain?"

Those who disagree with Sir Claude will start out dry and remain reasonably so, by acquiring some of the clothing and equipment listed in our "Let It Rain" bulletin. 3 cents to members, 10 cents to non-members.

Brevities

The *Hare and Tortoise* of winter sports—skiing and snowshoeing. In conference at Quebec city, 52 Canadian and 25 New England clubs emerged as the International Union of Snowshoers. . . . To switch to Easter, how about a sunrise hike? . . . Those confirmed individualists known as hikers have at last succumbed to dress regimentation. Over thirty members of a western club are *all* clad in dark blue and red checked shirts on trail trips. Does the leader rate as a Sergeant Major? . . . The other extreme is a distinguished eastern club, whose women members insist on wearing makeshift footwear—city left-overs. There's no substitute for a comfortable hiking boot. . . . If another feminine reference may be pardoned, the Melbourne (Australia) Women's Walking Club employs a "whip" to round up the slowpokes. No leather thong is applied; it is just an Australian term for *Rear Guard*. . . . Massachusetts trails, both trunk and feeder, now have a custodian in the Connecticut Valley Trails Conference. Trunk routes will be co-ordinated with New Hampshire and Connecticut systems. John B. Dickson heads the CVTC, with Mrs. Ernestine Perry as secretary. . . . The Huerfano Outing Club, whose unique set-up was described in a recent Forum, is now the Walsenburg Group of the Colorado Mountain Club. Philip Williams is chairman. . . . Sierra Club has officially approved the Youth Hostel movement, and is considering several San Francisco bay region projects. . . . When forced to make a bivouac on an exposed ledge, a New Zealand Alpine Club party emptied knapsacks and used them as foot warmers. Gadget-conscious pack makers might introduce an inner lining of blanket material. . . . *Mount Hood* (25 cents), *Crater Lake* (40 cents) and *The Olympics* (25 cents), are publications which bear the

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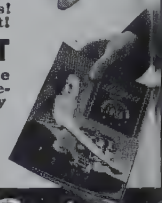

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authoritative imprint of the Mazamas, Pacific Bldg., Portland, Ore. . . . Worcester section of the Green Mountain Club had 121 of its 124 members on hand at annual meeting. Activity with a capital A, all right. . . . Tamalpais Conservation Club deserves the support ($1.00 yearly) of all users of Mount Tamalpais trails. Such Forum readers should obtain an application blank from Miss Penny Warwick, 333 Pine St., San Francisco, Cal. TCC maintains Tamalpais trails, springs and clean campsites; gives fire protection; and issues an informative periodical. . . . Forum editor was thoroughly sold on the floating dial compass while conducting a trackless hike in the rugged northwestern New Jersey highlands. He did not have to continually halt the group, as compass orienting was almost instantaneous. . . . Some sixty interested students belong to the combined hiking and outing club launched by San Mateo (Cal.) Junior College. Both men and women will receive full physical education credits. The weekly hikes will be entrusted to student leaders, with a faculty member always present. . . . It will be a banner occasion for Myron H. Avery and associates when the Appalachian Trail is completed. That day is drawing nearer, as only three difficult links—two in Maine and one adjoining the Great Smokies—totaling 41½ miles, are unfinished.

A County Hiking Group

To the best of our knowledge and belief, the only county organization (municipal) promoting organized hikes is the Westchester (N.Y.) Trails Association. It is a departmental activity of the county recreation commission. While the hikes are primarily for county residents, some of them are in adjoining counties.

The WTA commissary offered no problem on a recent moonlight campfire hike. Each participant was ordered to bring a can of a certain spaghetti-meat mixture, and a can opener. All the commissary chief had to do was to provide the large pot in which the contents of the cans were cooked.

And we suppose, to perfect the CC's conception of paradise, the hikers imbibed coffee from their own vacuum bottles.

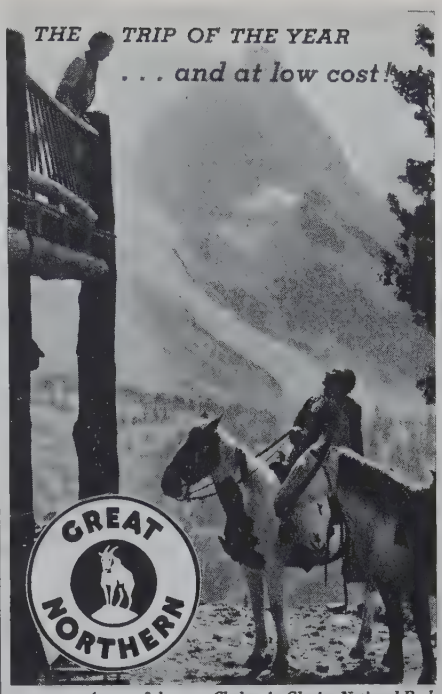
April Gadget List

1. Baked bean sandwiches for fifty people is a mammoth order for the camp cook when the number of unexpected guests exceeds the most liberal advance tabulations. The emergency calls for a hurried selection of an easily and quickly prepared hot dish, suggestions for which abound in *The Book of Quantity Recipes,* gratis from a famous firm.

2. Folder on *Camping With Canned Foods* gives menu layouts, and hints on what size cans (and varieties) to take on a week's trip for four people.

3. Julienne style crisped potatoes, packed in vacuum cans of convenient size, might be considered for a long trip, during which bulk and weight of fresh potatoes would prove prohibitive. "Very tasty," is the Forum editor's sampling verdict.

4. Portable camp or boat cook stove which burns vaporized kerosene. Can be readily converted into a heater for chilly mornings and nights, it is claimed. It weighs 4⅛ lbs. and one fuel filling is supposed to last about



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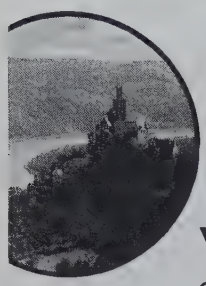

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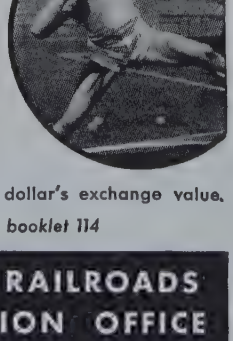

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7. In an Essex (England) village, farmers' wives have organized a hand-knitting industry. Wool used has the natural fat left in it, giving more warmth and longer wear. The line includes ski socks, stockings, scarves and mitts. Specialty is made of matched sets. Endorsed by one of the Mount Everest expeditions.

There's Always a First Time

Tenderfeet campers will, in mid-April, have their field day under the expert supervision of Frank Acker, of the Back to Nature Hiking Club of Philadelphia.

The promised experiences include sleeping on rocks and eating one's own cooking.

There's a grain of truth behind the flippant "you may never go again" promise of the club announcement. The Forum editor predicts that those survivors who can take it will soon return for more "punishment."

The equally enterprising Nature Ramblers Hiking Club, also of the Quaker City, has arranged, for late March, a joint trip with the Forum editor's own club, the Interstate of N.J. and N.Y., in the Ramapo Mountains of Southern New York. Nature Ramblers' party will travel some 180 miles by bus and 65 miles by train to connect with Interstaters on this Sunday trip.

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Spruce Knob is the deceptive name given West Virginia's highest mountain—a wide ridge with a level but bald summit about one mile long.

Marshall rates Backbone Mountain as "the only aggravating climb I made." This 3340-footer is in Maryland.

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The foregoing facts were extracted from Marshall's article in the 1935 issue of the *Mazama Magazine*. It is a continuation of the author's high peak adventures, the first sixteen of which were chronicled in the 1934 *Appalachia*.

High Sierras Book

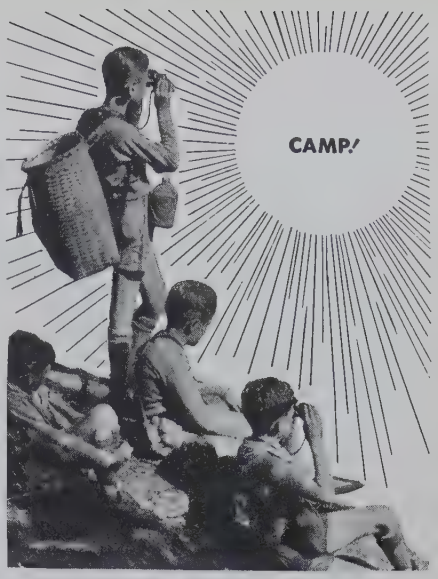
The readability of a mountaineering experience book, as distinct from a guide book, is put to a stiff test if you are unacquainted with the region. Some volumes make the grade, others do not.

In the latter category is *Mountaineering in the High Sierras*, published by W. W. Norton Co., New York, at $3.50. The original edition was published in the sixties, and has long been out of print. It is based on Clarence King's adventures in the High Sierras while making California's first geological survey, and is untechnical in treatment. The new edition, edited by Francis P. Farquhar (Sierra Club), contains a preface by him.

Quarter's Worth of Motor Camping

In *Motor Camping*, a Leisure League of America booklet costing a quarter, Porter Varney divides the Camping possibilities of the U.S.A. into seven regions, and gives an intelligent summary of each.

The chapter arrangement makes sleeping a more important function than eating. No matter whether you sleep before you dine or before you retire, you will find ways to gain soft repose, whether it be in a tent or a tourist cabin. You are made to understand what camp cookery entails, although you



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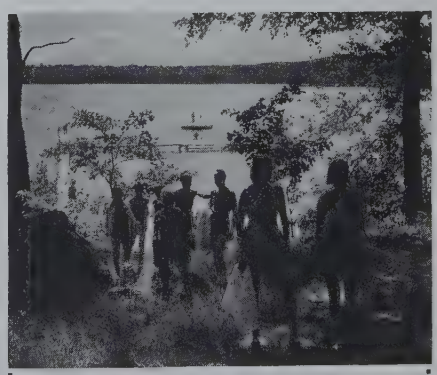

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What's Your Grub List?

"Did you starve?" exclaimed the sweet young thing of her friend, a young married woman, who had just returned from a motor camping trip.

"Quite the reverse; we had sufficient canned goods left over to feed an army. We provisioned before leaving the city, as hubby knew of an idyllic woodland glade concealed in a confusing crisscross of back roads, some of which were little better than cow paths!"

The happy medium in provisioning is the purpose of the *Sportsmen's Grub List*, issued by a mail order grocery house in New England. It corrects the common mistake of motor camping novices, who, when their party of two suddenly expands to four because their friends are unable to commit themselves far in advance, double their food purchases in *everything*.

This may be done with meats, eggs and some other foods which are the mainstay of a meal. In other instances the consumption will materially vary with individual tastes. Often the size of the container is arbitrarily fixed by trade conditions, and more may have to be purchased than two actually need. It is also advisable to have a varied larder rather than bountiful supplies of a few products.

The following commissary differences are worth noting for your next trip:

Supplies for Two Weeks

Product	*2 Persons*	*4 Persons*
Coffee	3-lb. tin	5-lb. tin
Fresh Bread	4 loaves	6 loaves
Prepared Flours (assorted)	25 lbs.	40 lbs.
Rice	3 lbs.	5 lbs.
Baking Powder	2 8-oz. tins	3 8-oz. tins
Canned Vegetables	8 tins	12 tins
Canned Fruits	5 tins	8 tins
Evaporated Fruits	3 lbs.	5 lbs.
Peanut Butter	1 7-oz. jar	1 12-oz. jar

The same amount of condiments needed for two persons will, under normal conditions, prove ample for four persons. For two additional persons a one-third increase in such housekeeping supplies as candles and soap is adequate. The short coach type of candle is recommended for camping.

British Inns Are Changing

Romantic ideas about British inns and hotels are all right at this safe distance. It is well to know, when on a British walking tour, that there are inns and inns.

Some have lost every vestige of culinary individuality by turning to canned foods. This is to be regretted, as each part of the British Isles is famous for some food delicacy, or the distinctive way in which it is served.

To guide the rambling visitor to those establishments still maintaining fine food traditions is the object of the *Good Food Register*, of the English Folk Cookery Association. Miss Florence White, the founder,

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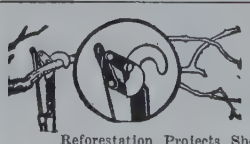

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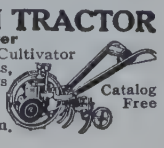

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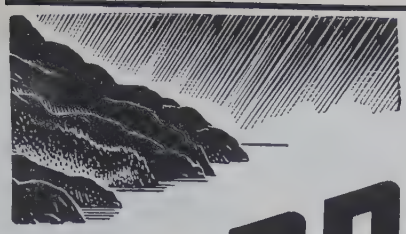
SPRINGTIME WITH NATURE

(Continued from page 204)

ourse is suspiciously indirect and there is omething just a little more deliberate than rdinary in her turning at some sixty yards watch us before she disappears over a ise. Sure enough, a few steps ahead and we re at the entrance to her den at the base f a large rock. The mound of earth thrown ut from the digging is marked with many small footprint, while all about are scat- ered parts of snow-shoe rabbits. We sur- rised this wild dog at play with her pups. We will hide in a dense clump of jack-pines hundred yards or more up on the steep ncline from the den. In less than half an our we catch just a suspicion of movement n the dark entrance we have so long been vatching. Almost instantly a pair of sharp ittle ears appear, then a nose; then, quick- y, a second identical pair of ears and their ccompanying nose. Next moment all have hrunk back, swallowed in the darkness of he burrow; we wait and wait, but in vain. To-morrow the family will be gone, "bag nd baggage", moved by the wily mother to ome new den for which we shall look and ook in vain. That is the invariable coyote nethod, once the den has known the close pproach and the dread scent of man.

On the same day another interesting find waits us—a robin's nest in which moun- ain bluebirds have made themselves at ome. Their solicitude about a robin's nest n the willows is explained when we find t contains fresh eggs. Out here the birds ave a way of doing such things. For in- tance, other bluebirds sometimes nest in he mud huts of the cliff swallow and the urrows of the bank swallow. From now on- ward the progress of the season is punctuated y the nesting of various birds. We find ests with fresh eggs of the pink-sided junco, Rocky Mountain hairy woodpecker, moun- ain chickadee, Swainson's hawk, western esper sparrow, western chipping sparrow, nd a black-billed magpie's nest with oung—a great ball of coarse twigs.

Thus, passing over much of interest and mitting even mention of many mammals, irds and flowers, we have glimpsed some f the outstanding features of this rich field n spring. To the newcomer a series of de- ightful surprises are here in waiting at any eason; those of spring are typical—sur- rises of two sharply contrasted kinds, but qual in pleasure. On the one hand are sur- rise meetings with old friends among the irds and plants, even little scenes of brook nd willows and nodding grasses in which ne can easily fancy he is about to hear an ndigo bunting sing. The next minute he is acing new scenes, listening to strange voices, ware of the exotic smell of sage. It is some- hing new to breathe day-long, come rain or hine, any all-pervading odor. It is some- hing distinctly more than merely new when hat odor is the odor of sage—the very reath of this great wild range country.



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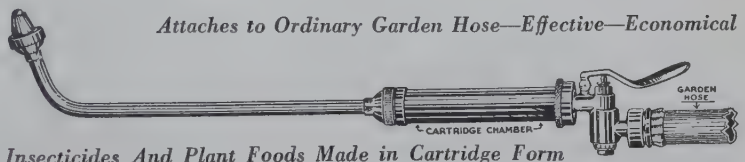

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Life in the Sea

Our knowledge of the inhabitants of the seas has advanced considerably during the last two decades. More and more time of scientists has been devoted to research in this field and a tremendous amount of material has been amassed. Much of this is buried in scientific reports and does not reach the layman. This fact inspired E. G. Boulenger, director of the aquarium of the Zoological Society of London, to gather some of this information into a book entitled *A Natural History of the Seas*. He has given us a popular book full of the ever-fascinating life of the ocean depths. The publishers are D. Appleton-Century and the price is three dollars.

Here Comes Texas

Texas is to be much in the news this year and is destined to be visited by thousands of Americans during the Centennial celebration. Therefore *Here Comes Texas* is a timely volume and many who plan to visit the Lone Star State will find it worth reading in advance. It is the work of R. A. Selle, who has written a variety of essays, short and long, about outstanding charms in Texas. Mr. Selle is a Nature lover and he devotes a great deal of space in his book to the resources of his state in wildlife. This is really a souvenir book and we find no mention of price. However, on the title page we find the admonition, "See Texas and Live 100 Years", and the further fact that the book was printed by the Carroll Printing Company of Houston.

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Teton Valley History

History of Teton Valley, Idaho, by B. W. Driggs, is a particularly interesting production for reasons that make it of the utmost value to present and future historians. We refer to the fact that the author, brother to a pioneer, acknowledges material assistance from many other early settlers. A few of these we had the pleasure of meeting in the valley twenty years ago. We remember with particular pleasure Thomas R. Wilson, pioneer of 1882, who numbers among his activities such varied ones as farmer, stockman, school-teacher and emergency physician. The participation of such men insure the accuracy of the account, and add immeasurably to its interest.

Teton Valley is one of those sheltered spots that in early times attracted hordes of game animals that were raised in the near-by mountains, and thus furnished a winter paradise for the hunter and trapper. Thus it became the rendezvous in the early years of the 19th century of many trappers, who had to contest the Indians' prior occupancy. It was one such trapper, Vieux Pierre, whose activities were responsible for its earliest name, Pierre's Hole. Other famous mountain men and travelers who were identified with its early history were Kit Carson, Captain Bonneville, N. J. Wyeth, the Sublettes, Jim Bridger, Joe Meek, Peter Skene Ogden, James Coulter, and Father De Smet. Well may the present inhabitants feel proud of the prominence in early times of their home.

The book is published by the Caxton Printers, Caldwell, Idaho, and the price is $2.50.—E. A. P.

Fort Hall History

Fort Hall, Idaho, was established by N. J. Wyeth, a business man from Cambridge, Massachusetts, in 1834. Two years earlier Wyeth had followed what was later to be called the Oregon Trail. Although Wyeth's company was unable to withstand the competition of the Hudson Bay Company, who soon gained control of it, Fort Hall exercised an important influence over the destinies of thousands of emigrants for many years. Few sites of early settlement have played a larger part in the history of our Northwest.

Fort Hall on the Oregon Trial, by Jennie Broughton Brown, has analyzed the motives and forces that were entwined with the establishment of this old landmark, and which were responsible for its later influence. No pain has been spared to weave into the narrative the story of the many colorful characters that were associated more or less intimately with the old trading post. Although little more than a monument now marks the spot, the influence of the establishment lives on.

Who has not thrilled at the exploits of Bonneville, Bridger, Coulter, De Smet, Godin, Jason Lee, McLoughlin, Meeker, Ogden, Sublette and other notables in widely different fields. To all these, Fort Hall was as important as London and New York now are to the British and to Americans.

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FROG HUNTING WITH A MICROSCOPE

(Continued from page 208)

a two-layered hollow sac (the *gastrula*), and next there is a third layer of cells that appears between the first two, multiplying and spreading rapidly. These three tiers of cells are designated as *germ layers*, because from them germinate all of the structures of the adult. Recognition of their importance in unravelling the secrets of development was outstanding among many contributions of the great German, Von Baer, father of modern embryology.

Now the hollow sac begins to grow in length and is properly referred to for the first time as an *embryo*. A crease appears down the back, soon forming a deep furrow (*neural groove*) which then closes over into a tube (*neural tube*), destined to result in the brain and spinal cord. Slight prominences mark the future sites of eyes, mouth and gills, and a stubby projection forecasts the tail. This neural tube stage is an important one in studying the relationships of parts.

The *external gill* stage is next, marked by three pairs of these structures at the sides of the head, and by a pair of *suckers* at the mouth site. These are organs of clinging and not of food-taking. Now the embryo wriggles free from the jelly and becomes a free-living animal, the *larva* or *tadpole*. Watch their movements and behavior in your aquarium.

The tail gradually lengthens into a swimming organ, equipped with a fin; external gills grow for a while, then are replaced by internal ones; the true mouth breaks through, supplanting the suckers, and is armed with temporary horny teeth; the intestine is long and coiled and suited to a strictly vegetarian diet. Later the hind legs and then the arms appear, the intestine shortens, bony teeth come on the scene, the tail begins to shrivel, the heart changes from two to three chambers, the animal takes on carnivorous feeding habits, and at length the young frog, with lungs in place of gills, crawls up on the land and grows to the normal size of the terrestrial adult.

Thus did amphibians conquer the land in ages past, a history which is repeated every year by the hosts of modern frogs. Observations of the details of this remarkable metamorphosis provide a thrilling chapter in studying the adaptations of organisms to their environment, and in illustrating the ways of evolution.

As for suitable stages to mount, there are the numerous cleavage steps—as many as you wish—but not less than the two, four, eight, sixteen and many-celled estates; then the blastula, gastrula or yolk plug, neural groove, neural tube, external gill and internal gill. Larger tadpoles are unsatisfactory as slide mounts, but may be preserved in small vials of 10 per cent formalin.

In addition to mounts of entire eggs and embryos, prepare bisected specimens of the blastula, gastrula, neural tube and internal gill stages. With a sharp safety-razor blade cut one example of each of these ages in two, the slice passing entirely along the back surface and through to the belly (*sagittal sections*), using material taken from xylol just before mounting. Fasten these bisected specimens to slides, cut surface uppermost; they will prove most instructive. Put them on separate slides, or on the same slide with the entire example of the same stage, as you prefer.

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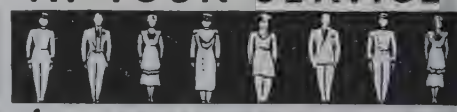
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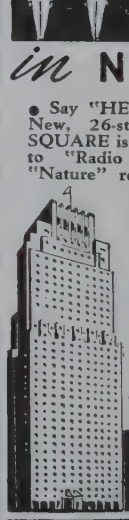

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The Tree Flower Book

Tree Flowers of Forest, Park, and Street ems to be the book that lovers of trees and eir flowers have long awaited. The author Walter E Rogers, Professor of Botany in wrence College, Appleton, Wisconsin. ne book is published there, and is copy-ghted by the author. A few more than a ndred species, including a few shrubs, longing to thirty-four families, are treated. In general the treatment is as follows. The ecies is illustrated by a full page silhouette a single tree, or a group, in winter con-tion, in some cases with a sketchy but very easing habitat picture. There then follow veral pages, describing in detail and illus-ating by photographs, greatly enlarged in e case of minute flowers, the inflorescence d, sometimes, the accompanying leafy anch. If appropriate, both staminate and stillate forms are shown separately. There e also numerous marginal drawings that ustrate leaves, winter buds, fruit or other teresting features.

Tree Flowers thus covers much more ound than its title indicates, and covers exceptionally well. While the book is iefly pictorial the relatively small amount text that accompanies the many superb d unique illustrations is pertinent and well epared. The author's knowledge and long perience in the teaching of botany permit nice discrimination in the selection of bject matter, both pictorial and textual, d no pains have been spared either in the eparation or the manufacture of the book. he paper for both text and plates was spe-ally manufactured. The margins are wide d the whole effect is particularly pleasing pographically.

On the title page credit is given Olga A. nith, instructor in Botany at the college r making the drawings from Nature. In e 8-page introduction the scope of the ok is explained, and very full acknowl-gments are made to many persons, botan-s of the highest rank, photographers, pub-hers, printers, friends and relatives, and a friend who through financial support ade the book possible.

Tree Flowers is manufactured by the Col-giate Press of Menasha, Wisconsin. It may obtained from the author, Appleton, Wis-nsin. The price is $7.50, postpaid in the nited States.

Photo Contest

Ten prizes of $25.00 each will be awarded the American Photographic Publishing ompany for the ten best unusual photo-aphs submitted in their contest closing ugust 1. The organization is preparing a w book on photographic amusements and esires to obtain pictures of any unusual notographic trick or stunt, or of any novel curious effects obtained by a camera. ffered as suggestions for contestants are usual Nature photographs, composite notographs, humorous or trick photographs, anything unusual or different from the dinary run.

Pictures should be accompanied by con-se descriptions of how they were made, referably not more than 300 words. Accept-le pictures that are not prize winners will purchased at the usual rates. Complete formation and contest rules can be obtained om the Company at 428 Newbury Street, oston, Mass.

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Photographic Notes

BY SAMUEL BROWN

Summertime Subjects

With the arrival of the summer months, the Nature lover finds a multitude of opportunities to pursue his photographic interests. In May and June one cannot help noticing the feverish activities of our feathered friends. Nest building, egg laying, incubation and feeding are a few of the occupations that may be photographed to our delight and satisfaction.

The nest is the center about which the whole life of a pair of birds rotates, and this is the place where our photographic activities should begin. The male often has one or two favorite branches on which he will perch and sing his merry song. The female has a route by which she approaches her home to feed the young, and often she stops on her way in one particular spot. Here we can focus our camera and wait for her to arrive. Many interesting action photos can be taken of birds alighting or taking off. This type of picture is particularly desirable.

Birds are naturally cautious and become very suspicious of unfamiliar objects. For this reason it is always best to carefully conceal or camouflage the camera. A good method is to make a shade or an umbrella of foliage-green material. Two holes, one for the lens and the other for observation, should be punched in it, and all shots taken from behind this. After the birds have recovered from their excitement of the unfamiliar object, they will fall into their regular routine and a series of many interesting pictures can be made from the hideout.

Many methods have been devised for having the bird snap its own picture. The simplest is to run a string from the shutter release and across the nest, but in this manner no control can be exercised over the position in which the subject will be photographed. A better way is to attach a piece of bait to the string which leads to the shutter release. With this method there is a better chance of getting a picture showing the bird engrossed in eating. Beef suet is a delicacy that is sure to attract many subjects.

Several precautions are necessary when setting up the camera for the bird to take its own portrait. Above all, careful observation of prevailing light conditions, from nine in the morning to four in the afternoon, should be made. This will enable setting the camera up to take advantage of the best lighting arrangements. Another important consideration is not to place the camera too close to the nest. A safety margin should be allowed. If not, you may develop your film to find the subject well on its way out of the picture. It is better to get the shot a little further away and then enlarge the interesting part than to be entirely disappointed.

Aside from the particularly wary species, birds will soon become used to the camera. With the former it is best to set up a tripod of sticks with a piece of turf, bark or moss on top. After a day or two they become accustomed to this and it is all right to place the camera in position.

"THE CHIMNEY NEST" TAKEN ON SUPER-SENSITIVE PANCHROMATIC FILM AT F.[illegible] ONE TWENTY-FIFTH OF A SECOND

Selection of stop and exposure are, of course, important. Where a fast shutter speed is necessary, the largest stop that will give the required depth of focus should be used. It has been found, generally, that 1/25 of a second is fast enough for most subjects. This means that, in good light, stops as small as F. 11 and F. 16 can be used. These conditions will bring the single lens and box cameras into practical use for this phase of photography. Incubating birds remain motionless for long periods and with these it will be possible to give exposures from 1/10 to 1/5 of a second. High speed film, such as super-sensitive panchromatic film, can be used with assurance of the greatest possible percentage of good results.

Never remove anything from the vicinity of the nest that cannot be replaced. If branches and twigs are obstructing the view of the camera, these can be tied back with strings and should be released after the pictures are taken.

* * *

Camera Types

Folding roll film cameras comprise a large variety of instruments ordinarily ranging in size from 1⅝ x 2½ inches (vest pocket; 127) to 3½ x 5½ inches (post card; 122 The single lens type works the same way[illegible] a box camera, the operating position of lens being at a definite point, no mat[illegible] what the distance between the subject a[illegible] the camera. However, the better ty[illegible] equipped with fast lenses, must be focu[illegible] for the proper distance due to the wide ap[illegible] ture and the shallow depth of focus. A sca[illegible] usually found on the left side of the le[illegible] standard, is marked with distances at wh[illegible] a pointer must be set, corresponding to number of feet from the subject to the ca[illegible] era. Other cameras are focused by turn[illegible] the front lens element to the proper d[illegible] tance setting. The separation thus obtain[illegible] determines the focus.

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Into the now popular class of miniat[illegible] camera fall the various makes of half-[illegible] and half-vest-pocket size. These instrume[illegible] use regular size film but take two pictu[illegible] in the space of one giving sixteen exposu[illegible] instead of eight. Some are made interchan[illegible] able so that both the standard and half s[illegible] may be taken. These cameras are precis[illegible] built and offer many of the refinements[illegible] the higher priced type. Later models h[illegible] built in range finders, high speed lens[illegible] rapid Compur and focal plane shutters, [illegible] For this type of camera, it is suggested t[illegible] a fine grain film, such as Panatomic Micropan, be used. When these are veloped in a fine grain developer, huge largements, comparable in quality to p[illegible] tures taken with larger size cameras, can[illegible] made.

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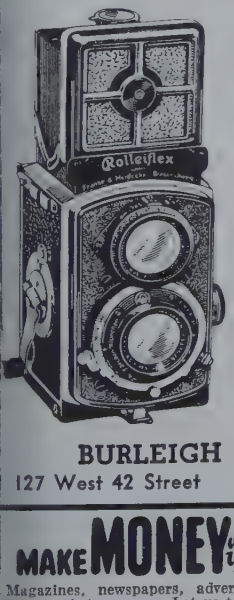

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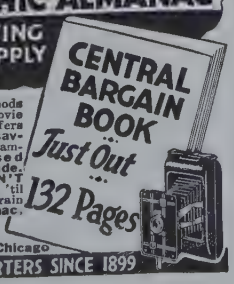

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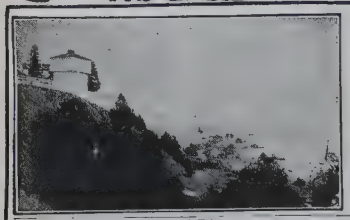

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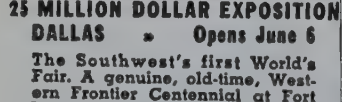

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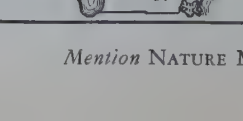

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Desert Surprise

By Ethel Severson

One warm May day in the desert near Palm Springs we toiled toward a little peak that rose between two deep palm-shaded canyons. With Mount San Jacinto and Tahquitz Peak towering close, our peak looked insignificant, but as the heat of the day increased and the cooling effects of our dip in the canyon stream wore off, the summit seemed less alluring and more tediously remote. Affecting to be beguiled by the vivid blossoms of the cacti and other exotic desert flora, we lagged and mopped our brows. We would not have loitered had we been aware of the reception committee that awaited us on the rocky height. When we were a few yards from the summit, a boy who had gone ahead ran back toward us shouting and pointing down the slope.

"Look, quick! Before they're gone! Mountain sheep—three of them!"

Forgotten was weariness. Breathlessly we looked where he pointed. Three mountain sheep were bounding gracefully, swiftly, down the mountainside. One wore great horns. They had waited until a human being was within fifteen feet of them, and then, timidity overcoming their curiosity, they were off like winged things.

Inasmuch as authorities estimate there are only one hundred to four hundred mountain sheep (*Ovis canadensis*) left in all California, including the desert ranges as well as the Sierra (indeed they are so scarce that a reward is offered to those who can report seeing one), we felt that the desert had given us its rarest greeting.

Wintering in Zion

Winters in Zion National Park are so mild that out-of-door picnics may be held in February. But the high altitude brings nights of such frostiness that the reptile exhibit, which is a summer feature, is discontinued. Harmless species are liberated, to find such quarters as their instinct recommends. Rattlesnakes this year were shipped to the San Diego Museum.

Young Robins Saved

By M. L. Hulme

In the early spring a pair of robins built their nest in the eaves trough of the residence of Mr. L. P. Gunson, Summerville Boulevard, Rochester, N. Y.

Three young birds were hatched one cold, windy day; while they were so young that they were yet without feathers, the nest and birdlings were blown to the ground. One fell on the stone walk leading to the entrance of the house and was killed. The other birds fell, one on either side of the front door and into the shrubbery, and this broke their fall and saved their lives. Someone from the house discovered them and took them into the house, almost dead from cold and exposure. They were warmed and then put in the nest, which was fastened to the sill of the window almost directly beneath where the nest had been.

As soon as the small birds were placed in the nest the old birds came and brooded and fed them. They lived to grow up and flew south in the fall.

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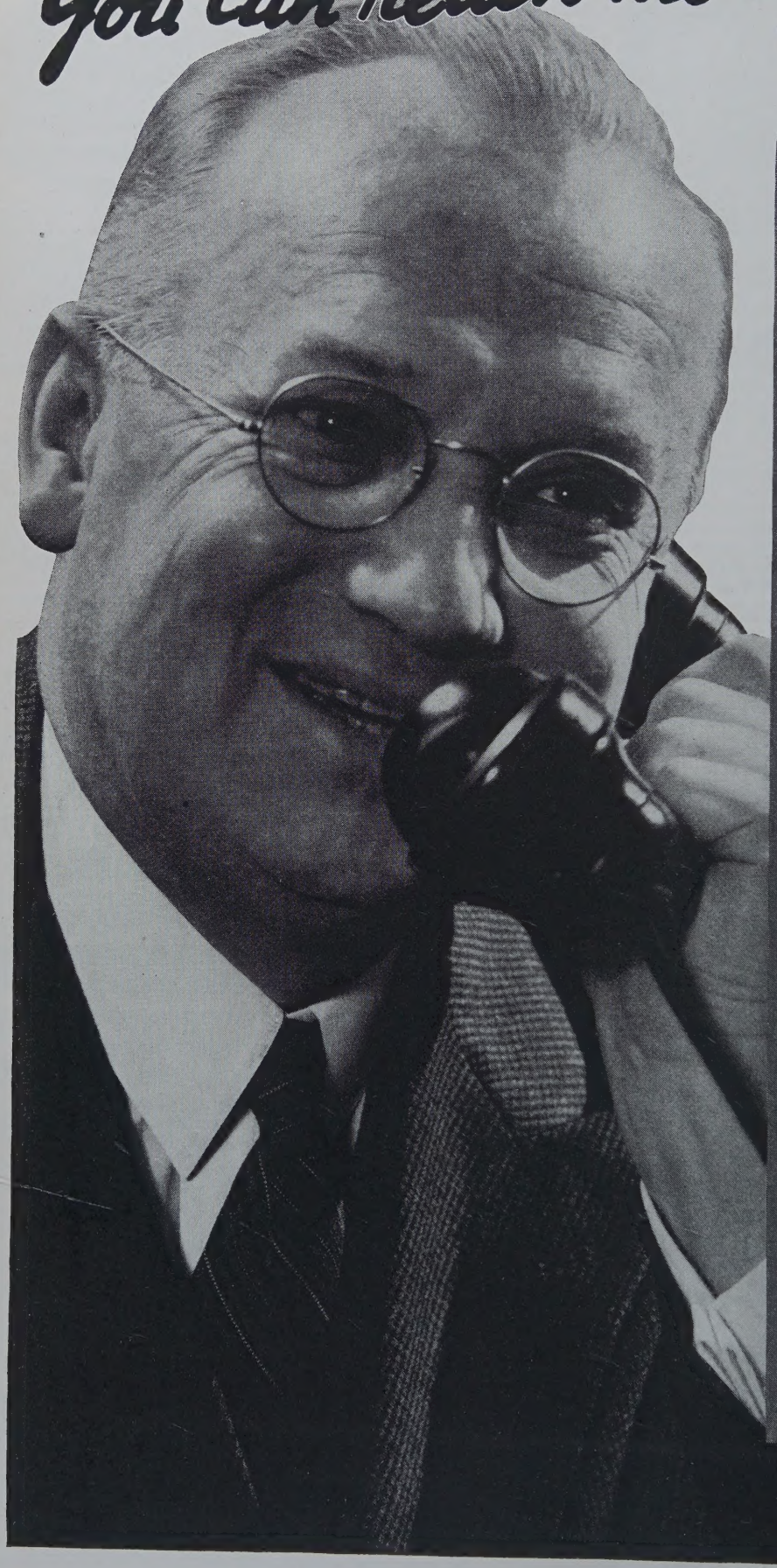

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The Month of May

JAMES THOMSON, preeminent poet of the seasons, said that—

> Among the changing months, May stands confest
> The sweetest, and in fairest colors drest.

The thirty-one May days that constitute our Fifth Month are, indeed, the culminating, complete, and most sustained expression of the year's happiest mood—spring, with its spirit of growth that is the essence of the meaning of the very name of May. Not only in its general character does the month express most inspiringly the abounding abundance of life, but also in its multiplicity of instances. Every living thing tells of new life and fresh growth, and the number of living things that are at hand in May is both amazing and inspiring.

The flowers that are described as belonging to March and April are in most instances also May flowers, but in addition comes a wealth of bloom that even without the heritage of earlier months would make May the richest of spring. The painted wake-robin holds erect its delicately striped blossom in low woodlands, the white trillium blooms along wooded ravines, and the red trillium nods its gracious flower in woods and thickets. Where northern woods are moist, the yellow clintonia, the dogberry, lifts its umbel of flowers high on a stem, but the May apple of lower zones overshadows its fragrant white bloom with luxurious leaves. Where woods are sandy or rocky, perhaps on the border of some swamp, the pink azalea is aflame. From rocky places, in woodland or clearing, the columbine is ringing its scarlet "rock bells." In wet, sphagnous spots the pitcher plant has nodding deep purple flowers with petals that curve inward, and in brooks, marshes, and wet meadows the forget-me-not's many-flowered racemes wave charmingly. Yet what May has to say with flowers is only suggested by these few blossoms from the month's bouquet.

Trees, too, are in bloom in May. The buckeye's showy panicles, the chaste and engaging flowers of the dogwood, the graceful, slender staminate blossoms of the red oak, and the delicate expanse of blossoms of the mountain ash—all are a part of May. White pine and hemlock and dozens of other trees also are in bloom, most of them so inconspicuously that the mention of flowers on trees is surprising outside orchards, where, of course, the fruit trees are in a fragrant bloom that is hardly less precious than the fruit in its season. "The flowers of the apple," said Thoreau, "are perhaps the most beautiful of any tree's, so copious and so delicious to both sight and scent." Yet it often seems that the most intimate floral expression of beauty in May is in the perfect, cream-white, fragrant locust blossoms, borne in bunches on slender stalks growing from branches that also carry some of the most pleasing leaves of the beautiful May foliage.

And with all the blossoms of May comes a renewed abundance of insects. Especially appropriate seem the butterflies—commas, swallowtails, wood satyrs, red admirals, painted ladies, and many others—which sometimes seem like flowers on the wing.

Then the birds. Back from southern Mexico or Central America the hummingbird, like the butterfly, goes from flower to flower, yet with a swiftness all its own. May also sees the climax of the northward migration of the far-flying wood warblers, most of which, Frank M. Chapman tells us, are known in Cuba as *Mariposas*, or "butterflies." To see a hooded or a chestnut-sided warbler flitting about or to look upon the brilliance of the Blackburnian's rich orange is to understand why. The redstart also seems at times to be blown about like a butterfly, and most of these apparent hordes of insect-eating midgets of the bird world are strikingly colored. Henry Van Dyke called the Maryland yellow-throat—

> A living sunbeam, tipped with wings,
> A spark of light that shines and sings
> *Witchery—witchery—witchery.*

No colors, though, can more than rival those of the Baltimore oriole, brilliant northern representative of a genus known otherwise among our eastern birds solely through the orchard oriole, with less display but perhaps with greater taste. The scarlet tanager, another winter resident of South America, does, however, rival the oriole, not only in brilliance but also in joyous and cheery song. No less pleasing than any of these bird colors are the tastily matched black and rose and white of the rose-breasted grosbeak, whose song also, says Chapman, "tells of all the gladness of a May morning." Another color returns from the sub-tropics with the indigo bunting, and another rare song, for of one of these birds Florence Merriam Bailey said that "against a background of blue sky and rolling white clouds, the blessed little songster broke out into the blithest round that ever bubbled up from a glad heart."

If one leaves the woods, however, and visits a swamp area in May he is likely to hear another bubbling song from the marsh wrens, and in such a chorus that no May music will seem more inexhaustibly joyous. There also in the marsh, perhaps like the wrens on a reed, the least bittern, dainty and spirit-like, offers another sort of evidence of the return of the birds and its significance. Similarly, along some pond or woodland stream, the solitary sandpiper, a wary transient on its way north, may impress one with the dignity of quiet living.

But, as with the many, many flowers, the dozens of trees, and the myriads of insects, there is no telling at once of all the birds, nor of all the forms of life that respond to the urge of growth in May. The whitetail, sole representative of the deer family in many of our woods, is bringing forth its fawns. Toads are laying their ribbons of eggs in woodland ponds. In the streams catfish are guarding their nests and fanning away the sediment that might smother the eggs. In all elements, in all kingdoms, there is beauty in growth in May.

—By HOWARD ZAHNISER

"EVERY FEW SECONDS HE WOULD PAUSE, THROW BACK HIS HEAD,
AND GIVE VENT TO A MELANCHOLY HOWL"